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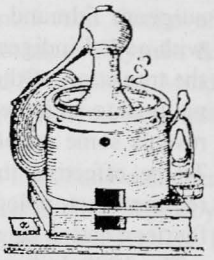

Editor: Dr. J. Burnby, B.Pharm., Ph.D., FRPharmS., FSA.
36 York Place, Edinburgh. EH1 3HU

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Wednesday, 26 May 1999.
Mrs. R. Weinstein, "Pill tiles and delftware."
Wednesday, 24 November 1999.
Dr Michael Jepson."The Birmingham Lunar Society

Congratulations.

Our **President, John Hunt,** has been awarded a Ph.D. by the University of Portsmouth for his thesis "The development of pharmaceutical services in the British welfare state". His supervisor, Professor Ian Jones, is professor of pharmacy practice at that university.

Well done, Dr Hunt.

Professor Harkishan Singh has been awarded the Schroff Memorial National Award for 1998 by the Indian Hospital Pharmacists' Association. Professor Singh is distinguished as a teacher of medicinal chemistry, a researcher in synthetic heterosteroids and as a pharmaceutical historian.

Reviews.

In the eighteenth century counselling disturbed students was robust compared to modern methods. When James Woodforde who was studying medicine at Edinburgh became distressed, his patron Dr Anthony Fothergill bade him dismiss his 'blue devils' and wrote, "Remember you are born to nobler ends, therefore banish spleen - banish melancholy". He suggested two hours brisk exercise every day, preferably on a "rough trotting horse".

This cure for depression occurs in "Take time by the forelock": The Letters of Anthony Fothergill to James Woodforde, 1779-1813. Edited by C.Lawrence, P.Lucier and C.C.Booth. (*Medical History,* Supplement No. 17, 1997.) Fothergill was a successful Bath physician until 1803 when he moved to Pennsylvania. Woodforde overcame his problems and graduated MD in 1794 and led an uneventful life practising medicine in Somerset.

The letters are a mine of information on medical, scientific and social matters in the late Georgian period including new medical theories, prescriptions, the new chemical nomenclature, the season in Bath, the Napoleonic wars, American affairs and the difficulties encountered in travel.

Diaries like letters open a window on to the past, an example being the diary of T.N.R.Morson referred to in Anthony Morson's biography *Operative Chymist* which was reviewed in the July 1998 issue of the *Pharmaceutical Historian.* On 5 September 1818 when T.N.R.Morson, aged nineteen, left London for Paris he began a record noting such things as the hop harvest (presumably as seen from the Dover Road), the state of the towns and villages in post-Napoleonic France and the sights of Paris.

It was an exciting place and time for a young man interested in the science of chemistry. Morson entered the establishment of Louis Planche and through him came into contact with some of the famous chemists of the day. He also became familiar with the research into the identification and isolation of alkaloids. His price list of 1821 listed among others, Sulph. Quinine., Acetate of Morphia, Stricnine (sic), Emetine and Brucine. Thus Morson, barely out of his minority, became one of the founders of an industry. This biography is of interest not only to pharmacists but to historians of chemistry and to anybody interested in the origins of the fine chemical industry.

Dr Harkishan Singh is writing a history of pharmacy in India, and the first volume *Pharmacopoeias and Formularies* (Delhi, 1994) is now available in this country. It deals with the dispensatory of the East India Company and the *Indian*

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Pharmacopoeia of 1868 compiled by a British surgeon, Edmund Waring, based on British texts with added indigenous drugs. Singh also describes the transition of the *British Pharmacopoeia* from a national to an imperial work of reference. The book reveals some problems facing officials of the Raj. To be effective the 1868 *Indian Pharmacopoeia* required a supplement listing drug synonyms in fourteen native languages.

The 1900 *Indian and Colonial Addendum* to the *British Pharmacopoeia* had to be hastily withdrawn when the India Office discovered that certain animal fats used in preparations would be highly offensive to the Hindu and Muslim populations.

Volume 2 of Singh's history is *Pharmaceutical Education* (Delhi, 1998) in which he shows that there was limited progress until after independence and the passing of the Indian Pharmacy Act of 1948.

Another recent work devoted to pharmaceutical education is *The University of Wisconsin School of Pharmacy: Its First Century* (Madison, Wisconsin, 1997). The school is distinguished in several areas, but the main interest here is its contribution to the history of pharmacy.

Edward Kremers who became director of the pharmacy programme in 1892 was committed to improving the status of the profession. He recognised the importance of history and introduced instruction in the history of pharmacy and of chemistry in the early years of the century, and also began a collection of material related to these subjects.

He was co-founder of the American Pharmaceutical Association's Section on Historical Pharmacy in 1904. When George Urdang was forced to leave Nazi Germany in 1939, Kremers invited him to Wisconsin where he became founding director of the American Institute of the History of Pharmacy.

The first doctorate in the history of pharmacy was awarded by the University of Wisconsin to Glenn Sonnedecker who acted as general editor of this volume under review.

Finally a note on a work described by Roy Porter as "a joy of a book". It is *Restoration London*, first published in 1997 and is now in paperback. (Phoenix, 1998) Liza Picard, the author, is a lawyer with an intense curiosity about how people lived in the past. The result is this portrait of London in the time of the Stuarts, from poverty to pets, from medicine to magic, from slang to sex, from wallpaper to women's rights. Readers of the *Historian* may be a little disappointed at the brief treatment of the materia medica of the period but there are ample compensations elsewhere in this intriguing work. A volume on the eighteenth century is in preparation.

M.P.Earles.

*Mixtum Compositum 1974-1998: Beiträge zu Verbandspolitik und Berufsgeschichte.*by Hermann Vogel. Govi-Verlag Pharmazeutischer GmbH, Eschborn, 1998, pp.482. ISBN 3-7741-0697-5.

This book presents the politics of pharmaceutical activity in Bavaria in the period 1974-1998. One may argue that this is too recent to be history, yet it is often clear that historical accounts refer to artefacts, ephemera, formulae and recipes with little or no reference to the effects upon and opinions of practitioners of pharmacy or consumers. In recording developmentsat the time of their occurrence, the writer presents material which will prove invaluable in future years.; the book is correctly described in the foreword by Prof. Dr Christa Habrich of Munich as, "a chronicle with flashbacks and future prospectives."

In the current work one can browse through a collection of greetings, eulogies, valedictions, funeral orations, commentaries, essays, letters and discussions of problems. A pleasant, continuing custom in Bavaria is the celebration of anniversaries,e.g. the 50th, 60th, 65th, 75th and 80th birthdays of distinguished colleagues, jubilees and foundation days of organisations etc. The period covered is divided into six four-year terms, the officers of the Bavarian pharmacy organisation for each period being reported. The author, Dr Hermann Vogel, is a member of a distinguished pharmaceutical and medical family as is shewn by their family history (pp.225-227). He was president of the Association from 1974 - 1998.

Among the topics discussed are the history of pharmacy in Bavaria with flashbacks to the earliest times and a record of apothecary shops from 1328-1900, the formation and development of the Bavarian Pharmaceutical Association, state examinations, future education and specialisation, pharmacopoeias from the Bavarian one of 1822 to *Deutsches Arzneibuch,8* (1979) to the current *European Pharmacopoeia*, the practice of pharmacy, the contribution of Alois Löcherer (1815-1861) to pharmacy and photography, the mortar bearing the coat-of-arms of the glass expert Joseph von Fraunhofer, health service regulation, the court pharmacy in Munich, pharmacists' shops in Munich in the 19th century, seals, trademarks and aadvertising with illustrations, outstanding Bavarian pharmacists such as Franz Pettenkofer (1783-1850), Carl Spitzweg (1808-1885) and Max Pettenkofer (1818-1901), pharmacy civil and military in Europe, successful initiatives including the German Pharmacy Museum in Munich, co-operation with the doctors in the quest for good health care, an illustrated account of a Munich exhibition, and the Döderlein family of Weissenburg (1515 onwards) and their contribution to gynaecology.

Well illustrated, although a few pictures lack

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captions, the book is clearly printed with adequate referencing to easily accessed pharmaceutical literature and good indexes to subjects, places and persons. This carefully recorded collection is full of useful inforderleinpormation, but it requires a reasonable knowledge of German as there are no English or French summaries.

William E. Court.

Apotheker-Kalender Calendar for Pharmacists 1999.

Once again Prof. Dr W-H. Hein and Dr W. Dressendörfer have produced a most interesting collection of illustrations for the 1999 calendar.

Amongst the artefacts are five goblet-shaped glass apothecary jars with parchment covers holding powdered drugs introduced into German pharmacy in the 18th century which probably came from the pharmacy of Metten monastery which closed in 1803. Then there are the eye-baths in cobalt glass of English manufacture with the patterned American poison bottle. The wooden containers which held herbal drugs and date from as far back as the late 15th century are shown. The two fine bell-metal mortars come from the famous Hachman foundry in the Duchy of Cleves established in about 1520; one dating from 1547 and the other from 1572, made by father and son.

A Baroque corner cabinet holds a collection of 'curiosities' from an orphanage in Halle which sold medicines from its pharmacy and sent missionaries overseas. In return they sent back ostrich eggs, pickled baby crocodiles and much else. The very badly defaced frieze from St. Gilles-du-Gard in southern France on the route to Santiago was perhaps not worthwhile and to my eyes the illustration of the restored Pelican pharmacy at Düsseldorf appears to be slightly out of focus. There is no doubt however of the value of the extraordinarily true-to-life and attractive paintings on the vaulted ceiling in St. Michael's church at Bamberg with its 578 flowers, herbs and trees; the plants had also a deeper religious interpretation.

Unusually, December shows a modern icon (1993) from Greece of Christ as a pharmacist but with all the traditional features.

The calendar may be obtained from:

Deutschen Apotheker Verlag, Postfach 10 10 61, 70009 Stuttgart, Germany for DM 48.

J.Burnby.

Information Please.

Can anybody tell us more about Ann Cooke of Manchester who died in 1795. We have a copy of her will by courtesy of Lancashire Record Office.

"In the Name of God Amen; I Ann Cooke of Manchester in the County of Lancaster **Chymist & Druggist** [Note] being of sound & disposing Mind and memory ... do make and publish this my last Will and Testament ....

First I give and bequeath unto my Grand-daughter Ann Appleby daughter of Thomas & Elizth Appleby of Manchester the sum of Five Hundred Pounds. I likewise give unto my Grand-son Samuel Appleby son of the aforesaid Thomas and Elizabeth the sum of four Hundred Pounds, the above Legacies to be paid as they ... respectively arrive at the Age of twenty one years or at the Time of contracting Marriage or the whole nine Hundred Pounds to the Survivor of them...

And it is my Will ... that after my Decease my Executors do put out the above Sums... to Interest in the most sure and eligible way... they can and the Interest arising ... when due to be added to their respective Principals ...but if they should die before they attain twenty one or contract marriage then the whole both Principal & Interest shall be paid to my Daughter Ann Wilson Wife of John Wilson of Manchester Merchant if living or to her Heirs with all... the residue and remainder of my real and personal Estate of whatever kind so ever excepting and paying unto Ann Hulme daughter of Margaret Hulme of Salford the sum of ten Guineas, One Mahogany Chest of Drawers, One plain silver Cream Jug and Six old Silver Tea Spoons. I do appoint my Son in Law Mr John Wilson and Mr Willm. Wright, Grocer both of Manchester Executors of this my last Will ... In witness whereof I have hereunto set my Hand and Seal this twelfth Day of June One Thousand seven hundred and ninety two.

Witnesses: John Hodson, Lydia Hodson,
Marianne Hodson.

Notes added are to the effect that probate was granted 16 March 1795 and that the value of the estate was over £2,000 and under £5,000; by no means an inconsiderable sum.

It is known that women practised as pharmacists long before either the 1868 Poisons and Pharmacy Act or their admission to membership of the Pharmaceutical Society in 1879.[1] Indeed no less than 215 are to be found on the first Register of 1869, most of them having received some training from medical or pharmaceutical husbands or fathers who no doubt found this unpaid expertise very useful.[2] Although denied the use of the Society's laboratories, library or lectures women were always able to sit the qualifying examinations and be registered.[3]

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Notes and References.

1. J.Burnby, "Women in Pharmacy", *Pharm.Hist.*, June 1990, **20:** 6-8.
2. S.W.F.Holloway, *Royal Pharmaceutical Society of Great Britain,1841-1991.* London, Pharm. Press, 1991, 261.
3. This refusal of membership to the Society has led many to believe, incorrectly, that women were not allowed legally to practise pharmacy after 1868 in the United Kingdom until 1879 e.g. "Women in Ontario Pharmacy, 1867 -1927" , E.W.Stieb, G.C.Coulas & J.A.Ferguson, *Pharm. in Hist.*, 1986, **28**:125-134.

Knaresborough's old pharmacy.

John and Margaret Savage of York have written to say that according to the *Yorkshire Evening Press* of 4 November 1998 that Nigel Wilson a local business man will re-open the shop as "a chemist's museum combined with a fruit and vegetable business." He has also pledged that the famous lavender water will be on sale again. It will be interesting to see how this project will be carried out.

The Queen and the Duke of Edinburgh visited Harrogate and Knaresborough on 10 December 1998, and whilst the Queen went to see the 'Royal Toffee Maker' in Harrogate, the Duke visted the old pharmacy and an electronics plant in Knaresborough.

The early years of pharmaceutical education in Bradford up to 1927.

J.W.Cooper.

This paper describes the period which culminated in the recognition of the Bradford course both by London University for degree purposes and by the Pharmaceutical Society for registration. Since I was closely concerned with the events, inevitably some of the account concerns my own career.

I was educated at Grange Grammar School, Bradford, and being awarded a part-time day and evening scholarship at Bradford Technical College, completed a 3/4 year course in chemistry, physics and botany during my apprenticeship at the old Bradford Royal Infirmary. My studies included a special course in the technology and analysis of fats and oils. I passed the 'Chemist & Druggist' examination in December 1917, and that of the 'Pharmaceutical Chemist' in July 1918.

Between completing the apprenticeship and qualifying, a short period of military service ended with my release under the 'Substition Scheme', the remainder of the period was spent in gaining experience in retail and manufacturing pharmacy.

By 1919 I had been appointed chief pharmacist at the Leeds Public Dispensary and Hospital. This had only a small in-patient section, being mainly a large out-patient hospital; the annual number of prescriptions dispensed ranged from 110,000 to 120,000. Additionally, I was responsible for teaching the pharmaceutical subjects for the Dispensing Assistants' examination of the Society of Apothecaries; chemistry was provided, not at the hospital, but at Leeds Technical College.

This joint course had been inaugurated in 1916 at the request of the Government which had become concerned about the possibility of continuing heavy losses at the Front leading to a breakdown of the nation's pharmaceutical services. It was thought that women possessing the Assistants' Certificate would be able to fill whatever gap might arise.

The hospital provided a well equipped dispensing laboratory accommodating seventeen students; the course extended over a year; never fewer than fourteen students passed the examination at the first attempt and in some years, all passed. After passing, the majority completed a further three months at the hospital participating in the routine dispensing. Thereafter they were quickly absorbed by doctors and retail pharmacists requiring dispensing assistants. Year by year applications for the course greatly exceeded accommodation right up to 1944.

In 1936 I gained the Diploma in Biochemical Analysis at Bradford Technical College which was supplemented by participating in routine pathological work at the hospital. At the beginning of World War II, the hospital's pathologist (Dr Bonser, MD, FRCP) was transferred to a large hospital earmarked for the wounded. I was then asked to undertake all the biological and haematological examinations, a task I undertook as 'war-time work' until my resignation as chief pharmacist in 1943.

From 1920-1943 I was part-time lecturer in pharmaceutical subjects at Bradford Technical College, the Leeds hospital board sanctioning my absence subject to a *locum tenens* being available. I had thus been engaged for 23 years (1920 - 1943) as chief pharmacist at a Leeds hospital with responsibility for teaching pharmaceutical subjects in a joint course with Leeds Technical College, and for 22 years (1921 - 1943) had been a part-time lecturer at Bradford. Indeed, until 1927 I was the only pharmaceutical lecturer at Bradford, and at the time of my appointment laboratory accommodation was extremely primitive, new equipment only being gradually acquired.

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I contributed to pharmaceutical education from 1929 onwards by way of several text books. With F.J.Dyer as co-author *Dispensing for Pharmaceutical Students* was published, although due to ill-health Mr Dyer was unable to contribute anything. I continued its revision for several years until I relinquished teaching. Colin Gunn then accepted my invitation to revise the book from about 1958 when it was re-named 'Cooper and Gunn'.

For *Tutorial Pharmacy* I was sole author until 1959 when again Mr Gunn took over its revision. A *Textbook of Pharmacognosy* by Cooper and Denston was formerly available, but due to pressure of work I discontinued participation in about 1942. With F.N.Appleyard a *Textbook of Pharmaceutical Analysis* was written but I no longer participated in this after about four years. Finally *Latin for Pharmaceutical Students* by Cooper and McLaren which has now become obsolete.

H. Richardson M.Sc. was appointed principal of Bradford Technical College in about 1920. I believe that he graduated in physics at the University of Manchester, then carried out research for which he was awarded an M.Sc. This was followed by service as a wardroom officer in the Royal Navy. Demobilised in early 1919, instead of resuming research, he accepted the urgent co-ordinating task of re-settling former undergraduates into suitable courses and assessing others for post-war training at Manchester University and Manchester College of Technology.

Bradford Technical College had virtually lacked a principal for a long period owing to the prolonged ill health of Mr Gardner. Not only had Mr Richardson to work hard to make good the retrogression the war years had imposed, but also had to cope, as in Manchester, with a large number of men discharged from the services who were eligible for grants. All this precluded him from giving more than cursory attention to pharmaceutical eduation; compared with the huge textile department, pharmacy was relatively 'small beer'.

During this very early period the first application was lodged with the Pharmaceutical Society for recognition of a course for the qualifying examination of the Society. Recognition was not granted.

Apart from the Society's own school of pharmacy at 17, Bloomsbury Square and the school at Chelsea Polytechnic, few schools or departments operated under public auspices. Much pharmaceutical education was provided by private colleges varying in quality from reasonably good to poor. During the 1914-1918 war the Society asked all the colleges and schools already recognised, both public and private, to enlarge their facilities in order to cope with the expected increase in applications from men demobilised from the services. Most, or all, did in fact accede to this request. Thus, the Society probably felt bound to refuse recognition of any fresh applications from either a public body or private college.

In 1919 a dozen 'demobbed' applicants were told that all places were full and that they would have to wait until the following October. They interviewed Mr Everett, then principal of Leeds Technical College, asking him, if possible, to arrange a joint course for the Society's Qualifying Examination. Mr Everett was sympathetic, feeling as most did, that having lost several years of their professional life these men should not lose a further year waiting for a place in one of the schools already recognised by the Society. Mr Everett consulted both Mr Gawler, M.Sc., head of the chemistry department of Leeds Technical College, and myself to ascertain whether we were prepared to take on the additional work of providing a course for these men.

We expressed willingness to do so and the scheme was submitted to the Society. It was sympathetically considered and approved. In its first year it was very successful; 100% passes were gained. Although approval was granted for another year to provide places for students unable to find them elsewhere, sufficient places did become available in subsequent years at recognised schools, and the 'temporary approval' of the Leeds course was discontinued.

All this indicates that existing facilities for pharmaceutical education in Yorkshire at that time were minimal.

Leeds College of Pharmacy was a private school, its owner and principal being Mr Pilkington-Sargeant, Ph.C, and by 1920 had been established a number of years. Mr Pilkington-Sargeant was a member of the Society's Council, being Vice-president at the period just described, and later President. Unless supported by external grants or charging very high fees, no private school was able to provide the standard of staff, equipment or accommodation of the publicly supported schools.

The Leeds College of Pharmacy had no grant from public sources and its fees necessarily had to be competitive with those of similar schools. Up to the onset of World War I pharmacy teaching had been heavily dependent on private enterprise as few public colleges offered specialised pharmaceutical courses. Apart from the two London schools few provincial cities made any provision; Manchester University was one exception, bestowing its first degree in pharmacy in 1908. The private schools thus met a real need at a time when the publically financed colleges did not. Many of the private schools were well conducted, being limited however by their financial status.

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After World War I it became increasingly obvious that the Pharmaceutical Society was anxious to see the transfer of all pharmacy education to the public sector.

Bradford's re-application for recognition.

In about 1923 Mr Richardson was able to review the pharmacy course and I had several briefing sessions with him on current pharmaceutical education. He decided that it would be opportune to re-apply for recognition of a course then designated 'Part 2 of the Qualifying Examination'. I was asked to prepare the grounds for such an application.

By this time the Society had set up local branches throughout Britain and I had been elected to the council of the Bradford branch. I called a meeting and was able to enlist their full support in our endeavour to secure recognition. Many hours were spent with Mr Richardson in preparing the application. It was a well documented survey of the need for Bradford's recognition, showing the distribution of approved schools, access to them from Bradford and the potential catchment area for students. Yorkshire with a population of three million possessed only the private school at Leeds.

A meeting with the Society's Education Committee was arranged which I attended to submit the application, accompanied by a member of the branch council to show its support for recognition.Edmund White, the then chairman of the Education Committee, received us courteously and accorded us a fair hearing. A revealing episode occurred towards the end of the meeting. Mr White had just begun to assure us that our submission would be carefully considered when Sir William Glynn-Jones, Secretary of the Society, interposed the remark, "The Society is under promise not to recognise further colleges in return for the undertaking given by existing schools to expand their accommodation to cope with the post-war explosion of demobilised soldiers." Mr White, extremely annoyed, turned to Sir William and said, "I will speak in reply."

A few days later we received the Society's rejection of the application. It was not unexpected.

The Sequel.

At the time of this rejection, I was aware that consideration was being given to the setting up of internal and external degrees in pharmacy by London University. It seemed obvious that no private school would be approved by London, so that the Leeds College of Pharmacy could well become ineligible to provide a degree course.

From various contacts, I knew that neither of the Yorkshire universities was able to set up a pharmacy degree course. Leeds University was desperately short of accommodation for its School of Medicine and the building plans would probably absorb all available money for up to ten years or longer. The recently founded School of Dentistry had no premises whatsoever, the hospital providing temporary accommodation, not only for the clinical work but also for its laboratory services. At the time I took up my appointment in Leeds this temporary accommodation had been in use for several years.

When Leeds University was approached about the possibility of establishing a school of pharmacy, the answer was that it might be interested in ten or twelve years time when other more pressing projects had been completed. From other sources, I knew equally well that Sheffield University was not interested either. So there seemed good prospects of Bradford being selected by London University for its external degree in pharmacy.

Shortly after the Society's rejection of our application, Mr Richardson and I discussed the future, if any, of pharmacy teaching in the College. He took the view that further efforts to secure recognition might prove useless, so that to continue any courses in pharmacy would be to restrict them to the Society of Apothecaries Assistants' Examination or to those students who, having completed Part I of the Society's examination were not old enough to proceed to Part II elsewhere. His belief was that it was right and proper to discontinue pharmacy courses as from the commencement of the next session and deploy the money saved to other matters.

I had not told Mr Richardson of the possibility that London University might explore and give its approval to Bradford Technical College for its external examination in pharmacy but now proceeded to do so. Already in other subjects the College was presenting each year a fair number of candidates for external London degrees. Many gained honours, so London needed no convincing as to Bradford's ability to provide training of a high standard. Further I was able to assure Mr. Richardson that neither of the other Yorkshire universities was able to consider founding a school of pharmacy.

Mr Richardson promised to re-consider his decision, and a few weeks later told me pharmacy classes would continue as before in the hope of securing London University's approval that a pharmacy degree should be set up.

In due course Bradford Technical College did establish a pharmacy degree course, and then applied to London University for recognition. During the negotiations, a delegation from London visited the College to inspect its facilities and to discuss the

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proposals for new laboratories. Amongst them was Saville Peck, MA,Ph.C. who represented not only London University but was on the Society's Council and was also their representative. After their tour of the College, Mr Peck told me that he had formed a favourable opinion of the College's potentialities, subject to certain provisions regarding equipment and laboratory accommodation being met.

The syllabus for the pharmacy degree of London had been agreed between the Society and the University, so that those students who gained the degree would be entitled to registration, provided they were 21, had completed a prescribed course of practical training and had passed the Society's forensic pharmacy examination.

At this stage it was obvious that the Pharmaceutical Society could no longer withold approval for the Bradford course. A number of years had elapsed since the Society had promised to protect schools of pharmacy from competition by new schools. The Society had a new Secretary, Hugh Linstead (later Sir) who clearly foresaw the disbanding of the old private schools, and the expansion of pharmaceutical education in colleges and universities.

Society recognition and London University approval was completed in 1927, and F.J.Dyer was appointed head of the Pharmacy Department.

It would be pleasant to record that everything now went smoothly, but this was not so. During the first session Mr Dyer burnt his hand, an accident which proved disabling for many weeks. As I was the only other member of staff, I had to devote far more time than usual to teaching at Bradford in order to cover the syllabus. T.C.Denston was then appointed as lecturer at the beginning of the second session together with two part-time demonstrators for laboratory work. Mr Dyer became ill early in this session and had to resign. Temporary expedients had to be adopted but satisfactory examination results were nevertheless achieved. F.N.Appleyard was then appointed to replace Mr Dyer.

My task of describing the 'birth-pangs' of the Pharmacy Department at Bradford has now been completed and it shows that the principal of the Technical College, Mr Richardson, and myself shared the duties of midwife.

Mr Cooper wrote this account in November 1977 after he retired and was living near Lancaster. An invitation to the fiftieth anniversary of Bradford's School of Pharmacy gave him the idea of writing this history, a copy of which he lodged with the British Society for the History of Pharmacy for our archives.

The old Bradford Technical College which was superceded in 1966 by a new building of a completely different architectural style.

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The Big C: Cancer Cures or Quackery?

W. A. Jackson
Honorary Curator of Collections,
The University of Manchester Medical School Museum

Cancer

> "Of all the Diseases which afflict mankind the Cancer is the most grievous and rebellious, and is generally incurable, by reason of its corrosive and malign venom fermenting in the Humours, which, so far as we can yet find, yields neither to Purging, Bleeding, Repellents, Discutients, Suppuratives, nor any other Medicine, inward or outward."[1]

So wrote the Army Serjeant Chirugeon, Richard Wiseman, in the seventeenth century. In spite of the passage of time this is still largely true today.

Cancer, which has been known from ancient times is still the disease feared by more people than any other. Galen believed that tumours could be formed by an excess of blood in the veins, or by a flux of blood and black bile,[2] a theory still held by Shakespeare's son-in-law Dr John Hall in the seventeenth century.[3] Both Hippocrates and Galen expressed doubts about the advisability of surgery, Rhazes thought that it was detrimental unless the cancer was completely removed and the wound cauterised, while Paré said that he had never known it to effect a cure.[4]

14th Century

In Wales a family skilled in medicine known as the Meddygon Myddfai or the Physicians of Myddfai, practised in Carmarthenshire from the thirteenth until the end of the eighteenth century. Their knowledge is preserved in manuscripts, the earliest of which dates from the second half of the fourteenth century. They used digitalis leaves which were applied externally for the treatment of tumours.[5] Digitalis was normally used externally until William Withering drew attention to the possibilities of its oral use as a cardiac stimulant in 1785.

Groves and Bisset state that it was "generally applied by inunction as a plaster or ointment, in treating violent headaches, swellings, abcesses (sic), as well as cancerous skin conditions". A plaster was made by pounding digitalis leaves with milk and mutton suet, which was then applied to the head as hot as it could be borne.[6] It seems probable that this would have been a more efficient method for transdermal medication than direct application of the leaf itself.

17th Century

Wiseman recognised that there were many different forms of cancer, and devoted twenty pages in his *Several Chirurgical Treatises* to the subject.[7] He advocated treatment by means of a diet to generate good blood, correcting and dispersing the atrabilious humours (i.e. those due to stagnant black bile), preventing the growth of the tumour, and if possible dispersing it.

Bleeding, gentle purging, and the administration of polypharmaceutical decoctions and electuaries containing herbs were recommended for dispersing the bile. To inhibit the growth of the tumour he suggested the application of lead or gold which had been beaten into thin sheets, or a number of preparations including 'oyl of frogs' (made by baking them with butter in their mouths), the application of rags dipped in frog spawn water, or in winter a cerate used to avoid changing the dressing too often with the accompanying risk of the patient taking cold. One of these was made from green frogs, powder of burnt crayfish, gold litharge, dross of lead, prepared tutty, white lead, the juice of solanum, vinegar, oil of frogs, ointment of poplar, calf's suet, and beeswax.[9] If the tumour increased in size he advised that the patient be warned of the danger, and where possible, suggested that it be removed surgically before it became too late to have any chance of success.

The Skilful Physician first published in 1656, was a medical self-help book which offered guidelines for preserving one's health as well as instructions for preparing 705 compound medicines for the treatment of a wide variety of diseases, including several topical applications for cancer. One of these was made from the leaves of herb-grace, ribwort, fetherfew (sic), groundsel, parsley, sorrel, boar's grease and a little bay salt, shredded together and seethed in verjuice and the dregs of ale.[10] Another, for breast cancer was made from the dung of a white goose and the juice of cellendine (sic) pounded together in a mortar; a paste for cancer of the nose, throat or mouth was prepared from the ashes of leaves of rosemary and red sage burnt in a chafing dish and then mixed with burnt alum and honey.

18th Century

In the eighteenth century, in his *Medical Dictionary* Motherby stated "A cure is never made but with the knife or cautery; when these methods of relief are not used, the treatment is only palliative."[11] As expected at a time when humoral treatment was still the norm, bleeding and purging were recommended. Other palliatives were tar water (both internally and externally), mercurials, cinchona bark, sarsaparilla and narcotic herbs such as solanum and cicuta (hemlock), and Mr Plunkett's Application, a cathaeretic (a remedy which consumed superfluous flesh) made from

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crow's-foot, dog fennel, brimstone, white arsenic, and egg yolk. Carrot poultices were used as a deodorant on cancerous ulcers.

19th Century

In the nineteenth century it was thought that malignant tumours could result from defective blastema, a fluid supposedly circulated in the blood which carried food to body cells. In 1867 William Waldeyer refuted this theory, maintaining that they were caused by an abnormally high rate of multiplication of cells, these cancerous cells sometimes being transported to other locations in the body in the blood or lymph. However, nobody could explain why this should occur.[12]

In the 1890s a young New York surgeon, William B.Coley noted that sometimes another infection could produce an immune response great enough to destroy a cancer, and made the investigation of biological vaccines in the treatment of cancer his life's work. Unfortunately, his cures were too infrequent to support his theory, and interest in the use of vaccines for this purpose lapsed for a number of years.[13]

20th Century

By the twentieth century it had been shown that tumours could be produced experimentally by a number of agents such as coal tar, ultraviolet light, X-rays, radium and uranium. In 1904 it was demonstrated that the rays produced by radium could destroy diseased cells, leading to its use in treating cancer.

Chemotherapy dates from this period. Cytotoxic agents will destroy cancer cells, but they also kill or inhibit the growth of healthy ones. Although this method of treatment has had only a limited success, from the 1960s the use of corticosteroids combined with other drugs has been able to prolong remissions of the disease, and even cure many cases of childhood leukaemia.[14] In the late 1950s the development of the antiviral protein interferon raised hopes that this might be the wonder treatment which would conquer cancer, but these hopes proved to be futile.[15] An immense amount of money has been and indeed continues to be spent on research, and it is now possible that, at last, we are beginning to understand the disease. Nowadays the commonest forms of treatment are surgery, radiotherapy and chemotherapy, but the patient usually suffers from side-effects, including nausea and hair loss, often only to achieve a temporary remission.

Quackery

Many of these therapies, particularly the earlier ones sound very strange to us today, but this does not mean that they must be thought of as quackery. They were the treatments recommended by orthodox medical practitioners of the day, men who were highly respected by their fellows. What then is quackery, and who should be considered to be a quack? A definition published in 1811 says that a quack is an ungraduated ignorant pretender to skill in physic, a vendor of nostrums.[16] More recently, the *Concise Oxford Dictionary* gives the definition as an "ignorant pretender to skill especially in medicine or surgery; one who offers wonderful remedies or devices, a charlatan." I don't believe that either of these definitions is really satisfactory. Not all quacks were ignorant, and not all were unqualified, but the words 'quack' and 'quackery' imply a degree of fraud.

Quackery has been known from classical times, but the advent of patent and then proprietary medicines from the mid seventeenth century onwards, together with the development of newspapers and the opportunities which they offered for advertisements, were responsible for a rapid increase in quack remedies throughout the eighteenth and nineteenth centuries. Some qualified medical practitioners who sold their own nostrums are considered to have been quacks. One can mention the physician at St George's Hospital who sold Macleod's Bread Pills (which contained nothing more than bread), and Dr James' Fever Powders, a very popular and powerful antimonial remedy which may well have been responsible for a number of deaths. Other doctors allowed their names to be used in the promotion of a number of different cures, for example Dr. Richard Mead and 'Pulvis Antilysus' (for the treatment of rabies), Dr. Hans Sloane and medicinal chocolate, and Dr. Richard Chamberlain's teething necklace.[17]

There can be no doubt that over the years a great deal of money has been obtained by a multitude of cynical purveyors of medicine and curative devices from a gullible public, who suffered from a great variety of real or imaginary illnesses. Perhaps the most flagrant example was the man who, in 1685, advertised a product which claimed to protect those who took it from a number of disorders which were "as yet unknown to the world." They included "the Strong Fives, the Wambling Trot, the Marthambles, the Moon-Fall and the Hockogrockle".[18]

Morison's Pills

One of the most notable quacks of the nineteenth century was the self-styled Hygeist, James Morison.[19] He developed a system of medicine in which it was believed that all disease, including cancer, came from impurities in the blood, and just as there was a single cause, so there was a single cure. The impurities must be purged from the blood by vegetable drugs, and it was impossible to purge too much. His

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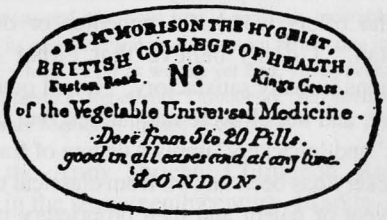
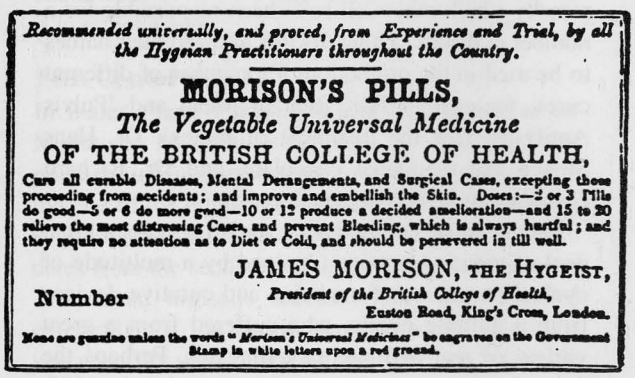
'Vegetable Universal Medicine' which was actively marketed from 1825, consisted of two pills, a mild aperient (No. 1) and a purgative (No. 2). These he promoted to such good effect that in 1834 Thomas Wakley observed that Morison paid more than £7,000 a year to the Government for the 1½d medicine duty stamps which had to be applied to his boxes of pills.[20]



In spite of the fact that several people died as a result of taking excessive doses (in 1837 they were responsible for twelve deaths in York alone), and their ridicule by caricaturists such as Cruikshank, Morison's pills continued to sell well, and in 1840 when he died they were on sale in the USA, France, Germany, and several smaller countries in addition to Great Britain. They were still being sold in this country until about 1929.


Recommended universally, and proved, from Experience and Trial, by all the Hygeian Practitioners throughout the Country.

MORISON'S PILLS,

The Vegetable Universal Medicine

OF THE BRITISH COLLEGE OF HEALTH,

Cure all curable Diseases, Mental Derangements, and Surgical Cases, excepting those proceeding from accidents; and improve and embellish the Skin. Doses:—2 or 3 Pills do good—5 or 6 do more good—10 or 12 produce a decided amelioration—and 15 to 20 relieve the most distressing Cases, and prevent Bleeding, which is always hurtful; and they require no attention as to Diet or Cold, and should be persevered in till well.

JAMES MORISON, THE HYGEIST,
President of the British College of Health,
Euston Road, King's Cross, London.

Number

None are genuine unless the words "*Morison's Universal Medicine*" be engraved on the Government Stamp in white letters upon a red ground.

20th Century Quacks

No less cynical, and nearly as dangerous, were a number of people who were offering cancer cures at the beginning of the twentieth century. Mr Joseph Wallace and Mrs C Leigh Hunt Wallace supplied 'Wallace's Twelve Specific Remedies' which were for the "Eradication of all Organic and Functional Diseases incidental to the present generation during infant and adult life." This was another complete system of medicine. Specific No. II was recommended for "Syphilis and every form of venereal disease. Cancer in every form, whether situated in the stomach, womb, bowels, kidneys, liver, lungs, breast, brain, throat, tongue, mouth, nose, or any other part of the body," as well as 22 other complaints. It contained berberine, hydrastine, and alcohol with an ingredient cost of approximately 2½d. for a one-ounce bottle which retailed at 2s.9d.[21]

The Wallaces were not the only people selling cancer cures. A Radium Salve varied in price from 2s.9d. to £1.10s.0d. depending on its radioactivity; the one which retailed at 5s.0d. was barely detectable.[22] Captain Feilden's Crimson Cross No. 1 Ointment contained copper oleate, anhydrous sodium sulphate, beeswax, resin and linseed oil, and another was made from copper oleate and aluminium oleate.[23]

A lotion contained zinc sulphate, phenol, glycerine, cochineal, and another 'cure' which was imported from Crete, was wood tar probably derived from birch trees. There were no instructions on the label, but presumably this was intended for external use. One mixture contained 0.02% of solids which seemed to be completely inactive, and 40% of alcohol probably obtained by bottling diluted spirit which had been stored in a wine cask. Another contained a dye resembling methylene blue, together with terebene, magnesium carbonate and a little acacia, the latter two ingredients being used to disperse the undissolved terebene which gave the mixture an aromatic taste and smell. A third contained tincture of ferric chloride, but perhaps the most blatant example of quackery at this time was the "Electric Fluid" which claimed to cure cancer, and retailed at several shillings per ounce. On analysis, this proved to be tap water![24]

Not all remedies were intended to produce the maximum return for the minimum effort and expenditure. Genuine attempts were made to help sufferers, but the ineffectiveness of these remedies is demonstrated by their multiplicity. In 1902 one self-help book certainly wasn't short of ideas for curing cancer.[25] It advised a vapour bath made with bitter herbs such as camomile, hops, catnep, and tansy, and rubbing the whole surface of the body with a liniment prepared by infusing cayenne in hot brine, as well as taking pills containing blood-root, extract of dandelion, lobelia seed, cayenne, senna and peppermint oil. A bleeding cancer was said to have been cured by drinking a quarter of a pint of goose grass juice daily, and covering the wound with its bruised leaves. A solution of citric acid applied topically was claimed to be very effective for the relief of pain and the reduction of swellings.

Externally a poultice made from cicuta leaves and slippery elm bark, or the 'Irritating Plaster' (burgundy pitch, beeswax, thick tar, Venice turpentine, blood-root, poke-root and cayenne) could be applied.[26] Another recommended plaster was prepared from beeswax dissolved in small beer and lard spread on

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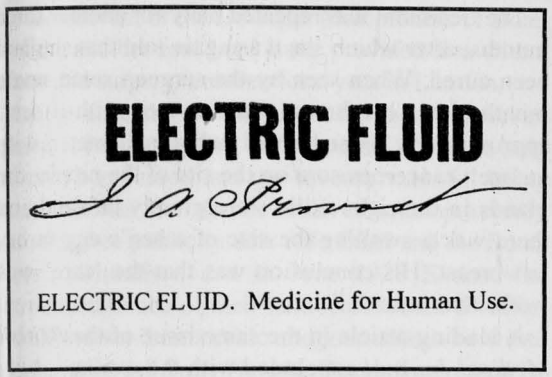

white leather, the resulting blotches being washed with sal prunello (sic) dissolved in warm water. One ointment was made from cayenne, lobelia seeds, meadow-fern, balm of Gilead buds and lard; another, known as the 'Black Salve', contained olive oil, resin, beeswax, Venice turpentine, red lead and camphor.[27] The root of the narrow leaved dock used as a decoction or in an ointment combined with lobelia seeds was said to have been found to produce "rare effects".

Cold baths had cured many. An unbroken breast cancer could be treated by keeping it moist with honey, rubbing the whole breast with spirits of hartshorn mixed with oil, or the application of a thin sheet of lead pricked full of pinholes, the patient being purged every third or fourth day. Certainly no shortage of different treatments, but how many genuine cures resulted from their use? It is noticeable that a number of these remedies date from the seventeenth century.

The Cardigan Herbalists

It is not always easy to decide whether a practitioner (orthodox or not) believed that the treatment he had advised would be of use, or was merely intended to provide a source of income with little or no regard to the patients' welfare. The case of two men who were regarded by the medical profession as quacks, but who probably genuinely believed in their remedy is examined in *Cancer Curers or Quacks?*[28] Much of the following information is derived from this book by T. Llew Jones and Dafydd Wyn Jones.

John and Daniel Evans were two brothers who lived at Pen-y-banc, a smallholding in the parish of St. Mary's, Cardigan; both were active supporters of the Tabernacle Chapel, Cardigan, and were held in high esteem locally. They were interested in medicinal herbs, and became known for their use of a medicinal oil with which they were said to have cured minor skin complaints. They began to treat skin cancers and their reputation for being able to cure these gradually spread throughout the country. The formula of the oil was a closely guarded secret. It was applied by means of a small brush, the same brush being used for all cases regardless of the condition treated, without troubling to take any measures to clean it between patients.

They opened a small 'surgery' in Cardigan, and in 1906 news of the cures which they were achieving led the *Daily Mail* to send Dr Hugh Riddle M.D. to investigate their claims. He reported that the brothers believed that secondary growths were root-like extensions of the original cancer with which they were still connected, and that the oil caused these to retract into the primary growth, which then fell off leaving a wound which soon healed. They claimed that they had never turned anyone away, and in the many years during which they had been treating patients had had only one or two failures. At that time there were about 45 people being treated in Cardigan for lupus, rodent ulcer, epithelioma and true scirrhus of the breast. Although he does not appear to have confirmed that the brothers' treatment actually cured cancer, he wrote:

> "Everywhere there seems to be the same utmost confidence in these simple physicians. Far from being advertising quacks, with a desire for notoriety, they are deeply religious men, and commence every treatment by praying for success, and urging their patients also to put their trust in God, rather than in themselves for cure."[29]

It is probable that Riddle's report was responsible for an increase in the number of patients who came to Cardigan to consult the herbalists. Existing records show that in 1907 hundreds of patients descended on the town, much to the dismay of the its inhabitants, particularly the hoteliers and local business people. They felt that the presence of so many people with disfigured faces or other signs of cancer adversely affected their businesses by deterring ordinary visitors.

One girl was expelled from chapel for refusing to drink from a communion chalice which was also used by sufferers with cancerous sores on their faces and lips. It is interesting to note that in the following years chapels in the area replaced their chalices with

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small individual glasses. By 1907 patients were coming from America, Canada, France, Germany, Africa and Egypt. The brothers' 'miracle oil' had become known throughout most of the world.

Unfortunately their reputation for miraculous cures had its drawbacks. Amongst the sufferers who flocked to see them were many with growths which were so far advanced that there was no hope of recovery - people who had tried all the conventional therapies, who had seen the finest physicians, and who now knew that they were going to die from cancer. Such people saw the brothers' treatment as a last desperate chance and many of them died whilst they were their patients. In fact, this was the fate of so many that Cardiganshire became the Welsh county with the highest rate of mortality from cancer, whereas previously it had had the lowest.

Continuing reports of people who had been cured by the Evans brothers resulted in the *Daily Mail* criticising the British Medical Association for its failure to take these seriously. Other newspapers attacked the Cancer Research Committee which had been founded for the specific purpose of finding a cure for cancer, but refused to investigate the cases because the brothers would not disclose the oil's formula.

However, their work did not receive universal acclaim. A leading article in the *British Medical Journal* in March 1907 observed:[30]

> "There may, for aught we know, be some virtue in their herb. But as far as can be gathered from the newspaper reports, which it may safely be assumed, do not minimize their achievements, there is no shadow of evidence that they have ever cured a cancer.
>
> Taking the reports as they are given, the disease dealt with was clearly lupus. This has been pointed out by more than one medical practitioner in the neighbourhood."

In December the following year in the same journal J. Lynn Thomas, surgeon to the Cardiff Infirmary, reported that he had seen cases of lupus, syphilitic ulceration, epithelioma of the lip and rodent ulcers, which were being treated by the Evans brothers, and which were described locally as "cancer that the medical profession could not cure." He also reviewed the case of a woman who had been sent to him for treatment after being 'cured' by them on two occasions at Cardigan. The whole surface of her right breast had been painted with the oil daily, including Sundays, for five months. She was then told that she was cured, though her breast was covered with dried up crusts which were said to be the roots of the cancer drawn to the surface. In seven weeks she returned as the skin had not healed.

The treatment was repeated daily for another three months, after which she was again told that she had been cured. When seen by the surgeon some seven months later her breast was covered with a scar, approximately six and a half inches in diameter, with an open cancerous sore on the site of the nipple, the glands in the right axilla were grossly infected and there was a swelling the size of a hen's egg in her left breast. His conclusion was that the 'cure' was worse than a farce.[31]

A leading article in the same issue of the *British Medical Journal* concluded with the words:

> "... while catchpenny newspapers proclaim 'cures' wrought by herbalists and practitioners, regular and irregular - for we are sorry to say, some of them are members of the medical profession - without troubling about the ultimate fate of the patients, deluded folk will flock to them. 'Cancer curing' is to our mind the most execrable of all forms of quackery, for in addition to the bitterness of disappointed hopes, it inflicts an incalculable amount of unnecessary suffering."

David Rees Evans

Daniel remained a bachelor throughout his life, but at the age of 38 John married Mary Evans, a 17 year old girl who was their maid at Pen-y-banc. They had two sons and two daughters. The elder son, David Rees Evans born in 1892, learned the secret of preparing the 'miracle oil' before his father's death in 1913. Both sons served in the Royal Army Medical Corps in World War I, and John the younger of the two, died on active service. After his uncle's death in 1919, David alone knew how to prepare the oil; he had married during the war and had five children.

After his demobilization David practised as a herbalist in Swansea and later in Cardiff. He is said to have successfully treated a number of cancer patients. One of these was a coal-miner's wife, Mrs Rose Chambers. She had received radium treatment for a breast cancer diagnosed as malignant at Cardiff hospital, but it proved ineffective and a radical mastectomy had been recommended. Instead she went to David Evans and in June 1919 started a fourteen-week course of herbal treatment, at the end of which she was said to have been cured. Some years later she gave birth to a baby girl whom she breast fed. In 1950 she was still in good health.

David did not receive the publicity or attract the number of patients which his uncle and father had done. His income was barely sufficient to support his family so he moved to Liverpool and then to London in the hope of improving his practice. Whilst in Cardiff he had been successful in treating

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a maid-servant of the Dowager Marchioness of Bute, and she and her son, Lord Bute, provided him with a home and surgery rent free for a year in London.

In the first six months there he had only seven patients, but at the end of this period six were said to have been cured and the seventh was still being treated. It was then that he received some extremely valuable free publicity. His wife Ethel and the Butes were spiritualists, and in June 1928 Evans was introduced to one of their number, Hannen Swaffer, a well-known drama critic and journalist who wrote a column in the *Daily Herald*. Deeply impressed by the story of the 'miracle oil' and the cures achieved, he visited former patients whom Evans had treated to investigate the truth of his claims. This investigation convinced Swaffer that Daniel and John Evans had indeed discovered a cure for cancer, and that David was still using it successfully. In an article published in *Light*, the official journal of the spiritualists, he castigated the Cancer Research Committee for their refusal to investigate Evans' claims in spite of the testimonies of numerous people who had been cured by him after treatment with radium, X-rays and surgery had been unsuccessful, merely because he would not disclose the oil's formula to them.

This endorsement of Evans' treatment by such an eminent figure resulted in a change in Evans' fortune. More patients, including some with cancer, came to see him and he placed advertisements in the newspapers quoting some of Swaffer's remarks. In 1928 and 1929 his income improved to such an extent that he was able to bank £1000 (a considerable sum at the time), but his troubles were not over. In September 1928 he started to treat Mrs Amelia Burrell for breast cancer. She was to receive treatment six days a week for three months, but before this was completed she complained of the pain resulting from it.

Additionally a large abscess had developed on her breast, and Evans had painted this with a lotion causing her even greater pain. He in turn complained that she had attended his clinic unpunctually and at irregular intervals. Eventually it was agreed that she should have a respite from treatment to enable her to regain her strength, Evans suggesting that she return later to complete the course. Instead of this Mrs Burrell went to the Cancer Hospital and was treated with radium. However, she was told that the cancer had spread and was now so far advanced that there was little hope of her being cured.

In 1929 she sued Evans for damages for personal injuries resulting from his negligence. She described how he had painted her breast with fluid, afterwards applying a large lettuce leaf held in place by gauze as a dressing. The case received wide publicity and was followed closely by the public, as well as by both orthodox and unqualified medical practitioners. The prosecution maintained that Evans, an unqualified practitioner, had been negligent by applying caustic fluid to her body and that his advice had prevented her from consulting a qualified doctor. In 1928 it might have been possible to cure her, but this was no longer the case, solely because of the defendant's treatment.

The evidence was conflicting. Evans received support from a number of patients who claimed that he had cured their cancers, as well as from a qualified medical practitioner. Dr James Bolton stated his firm belief that Evans had a cure for cancer, and offered to drink the contents of a bottle of 'miracle oil' in full sight of the court to prove that it was not caustic.

On the other hand Mr R. H. Swan, senior surgeon at the Cancer Hospital, Fulham, said that there was no evidence that a patient whom Evans claimed to have cured had ever had cancer, in spite of the fact that she had been diagnosed by a consultant at a Cardiff hospital as suffering from breast cancer. It was shown that just before the trial commenced, Evans had transferred almost all the money in his bank account to that of his wife, which could be interpreted as a sign that he expected to lose the case. In addition Mr Justice Charles appears to have been unsympathetic, poking fun at the lettuce leaf dressing, observing "I have a naturally inquiring mind and wondered why lettuce instead of cabbage?" Finally, his summing up appeared to favour the case for the prosecution.

Rather surprisingly David Rees Evans was acquitted. Possibly the fact that he had never submitted an account and had received no payment from Mrs Burrell had some bearing on this. However the adverse publicity resulting from the court proceedings, and his failure to cure this patient far outweighed any reports of the cures which he claimed to have effected.

In 1934 he was in trouble again, accused of the manslaughter of Miss Alice Bishop, a 62-year-old lady whom he had been treating for breast cancer from 30 April to 15 September. She had then been moved to a nursing home on the advice of a doctor where she died on 21 September from syncope from toxic absorption due to ulcerated carcinoma.

In his summing up the coroner said that there was no question about Rees Evan's good faith, and that to find him guilty the jury had to be satisfied that his treatment had caused or accelerated death; personally, he saw no evidence of this. However the jury found

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Evans to be guilty of manslaughter. The coroner pointed out that there was no evidence that the treatment had shortened her life, and the jury then returned a verdict that death was due to natural causes accelerated by lack of treatment, with a rider condemning the interference and negligence of David Rees Evans. On this occasion he was fortunate to have had a sympathetic coroner.[32]

This does not appear to have shaken his faith in himself. He continued to work as a herbalist, and by 1946 he was regaining his reputation as someone who was able to cure cancer, attracting an increasing number of patients. It was at this time that he met Fyfe Robertson, a journalist who worked for the then famous magazine *Picture Post*. He became convinced of Evans' ability to cure certain types of cancer; after some initial opposition he persuaded the editorial board to investigate and report on the man and his work. Their reluctance to investigate and publish on the matter is readily understood.

The Cancer Act had been passed in 1939 making it not only an offence to offer to treat, prescribe a remedy or give advice about the treatment of cancer to anybody, but also to refer to any article or articles in terms calculated to lead to its or their use in the treatment of cancer. There was a number of exceptions allowed to make it possible to circulate information to the medical and allied professions, members of Parliament, local authorities, or the governing boards of voluntary hospitals, but none of these could be said to be applicable to an article of the type envisaged.[33] If Evans' treatment proved to be successful the report would constitute an advertisement for it, making the magazine liable to prosecution; if it did not, it would become an exposure of quackery in a sensitive and emotive field.

The investigation lasted three years with photographic records being made of the progress of people undergoing treatment. These showed that tumours were being cured, but it is said that doctors were unwilling to co-operate with the investigators due to the fact that Evans was unqualified, and therefore were possibly not prepared to support the claims due to the fear of antagonising the British Medical Association. They refused to confirm that his patients had definitely been suffering from cancer although some of those whom Evans healed had previously been treated by qualified practitioners and had been thought to be incurable.

In 1949 David Rees Evans was invited to use his herbal treatment on patients who were already certified as suffering from cancer at the Presbyterian Hospital in Newark, New Jersey, USA, working under the supervision of a team of American doctors which included some of the leading oncologists of the day. He was allocated a ward containing sixteen patients, ten of whom were considered to be terminally ill with a life expectancy of a few months. Owing to the illness of Fyfe Robertson he was accompanied to America by Derek Wragge Morley, who sent his reports to *Picture Post*. A summary of the results which they published is:[34]

9 patients - treatment successful, cancer disappeared and wound healed.
2 patients - partial success, cancer reduced but not cleared.
1 patient – failure, patient back on sulphonamides.
4 patients - died during the course of treatment.

The articles published in *Picture Post* again aroused public interest in Evans' treatment, and the Ministry of Health came under pressure to investigate it. In September 1950 the Minister of Health, Aneurin Bevan, agreed to establish an independent committee to consider Evans' claims and advise if they warranted further investigation. The members of this committee submitted their report in December 1951 to Mr Iain Macleod, who had replaced Aneurin Bevan due to a change of government. It was never published. The reason given by Mr Macleod was that it contained confidential information supplied by Evans and by patients and their relatives. In May 1952 the minister gave a summary of the committee's conclusions which included the sentence, "With the probable exception of cases of rodent ulcer, Mr Rees Evans has been unable to provide us with evidence that convinces us of his having obtained lasting success in any undoubted case of cancer." Ironically the investigation for which Rees Evans had asked for so many years had proved to be the end of his hopes of being recognised as a herbalist who possessed a cure for cancer.

His public career finished, even though many of his supporters remained loyal to him, Evans dropped into obscurity but continued to treat patients for cancer until his death at Brighton in 1961. According to his daughter, Mrs Grace Williams, he had not passed on the secret of the cancer cure to any of his children because he did not want them to be persecuted as he had been.

Did these Welsh herbalists really have a cure for cancer? There is a considerable amount of evidence to suggest that they were more successful in many cases than orthodox medical practitioners. Was Rees Evans treated unfairly by the medical profession due to a bias against unqualified practitioners, or did he really fail to provide them with indisputable proof of his successes? In the absence of formulae for the

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preparations used, particularly that of the 'miracle oil', it seems unlikely that we will ever be able to decide with any certainty. One can only regret that he never revealed the secret of the formulae involved, and that because of this the medical profession were unwilling to investigate his claims. Finally, it is a pity that the full official report of the committee submitted to the Minister of Health in 1951 was never published.

There are many different types of cancer and it is unlikely that any treatment will be found which will be effective for all of them, but currently progress is being made and prospects are probably brighter now than at any time in the past. Realistically we can anticipate great advances being made within the next ten years.

Notes and References

1. Repellents are those which prevent such an influx of fluid to any part as would raise a tumour. Discutients dissolve a stagnating fluid and disperse it. Suppurants are external applications which promote suppuration, such as bread or oatmeal poultices. If the patient was of a 'cold' temperament and there was little inflammation, galbanum or onions could be added to the common bread poultice. Wiseman R. *Several Chirurgical Treatises*, 2nd edn. London: Royston, 1686:102.
2. Porter R., *The Greatest Benefit to Mankind*. London: Harper Collins, 1997: 575.
3. Lane J., Earles M., *John Hall and his Patients*. Stratford-on-Avon: The Shakespeare Birthplace Trust, 1996: p. xxxii.
4. Porter R., (ref.2). op. cit.: 59, 575.
5. Turner I., Turner T.D., 'Ymarfer Fferylliaeth Meddygon Myddfai' ('The pharmacy of the physicians of Myddfai'). *Pharm. Hist.*, 1983; 13 (2): 2-5.
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8. Cerate or Cerote - an external preparation which was softer than plasters, but stiffer than ointments and made with wax.
9. Gold Litharge - yellow lead monoxide. Dross of Lead - prepared by melting lead and raking off the scum until it is entirely reduced to dross. Tutty - impure zinc oxide.
10. Herb Grace - rue. Ribwort - *Plantago lanceolata*, - a member of the plantain family. Fetherfew - feverfew. Verjuice - an acid liquor obtained from crab-apples, sour grapes etc. Balaban C., Erlen J., and Siderits R., (editors). *The Skilful Physician.* Amsterdam: Harwood Academic, 1997: 46-47.
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20. *Lancet,* 1833-1834; **2**: 569.
21. Anon., *More Secret Remedies.* London: BMA, 1912: 210-217.
22. Ibid.: 234-235.
23. Ibid.: 181.
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34. Jones and Jones (ref. 28): 83-84.

A B.S.H.P. group visiting the old Knaresborough pharmacy

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Contents

Diary Dates

Wednesday 26 May 1999
"Pill tiles and apothecaries' delftware - information from recent excavations." by Mrs Rosemary Weinstein.
Wednesday, 16 June 1999
Second visit to the reserve collection of the Science Museum at Blythe Rd., London. W14.
Vauxhall Festival, June 1999.
All are welcome to join tours of the Royal Pharmaceutical Society's Museum on Tuesday and Thursday afternoons throughout June.
Booking essential. Please contact Lorraine Jones on 0171 735 9141, ext. 354 to book or for further details.
London Open House Weekend. Saturday, 18 Sept 1999.
Free tours of the Pharmaceutical Society's H.Q. at 1, Lambeth High Street, London, as part of the capital's display of modern architecture; the tour includes the council chamber and roof terrace.
Guided tours on the hour and half hour, 10 a.m. to 4 p.m. Last tour 3 p.m. No need to book.
Wednesday, 24 November 1999
"The Birmingham Lunar Society" by Dr Michael Jepson.
20 - 23 October 1999. Florence, Italy.
The 34th International Congress for the History of Pharmacy.

Blythe House.

Thirty members of BSHP visited this repository of the Science Museum's reserve store on 16 February 1999. Dr Robert Bud gave an opening address and then guided the party through a number of rooms housing Sir Henry Wellcome's vast collection. The visit was greatly appreciated by our members, so much so that it was much over-subscribed but the Science Museum has kindly invited us again on 16 June 1999. (There is a suspicion that this visit too is already over-subscribed - but try your luck!)

Ann Cooke

Mr K.D. Richardson of Colwyn Bay has written to us to say that Ann Cooke was mentioned in his article "Pharmacy in Manchester pre the Pharmaceutical Society" in Vol.20, No. 4, (Dec. 1990) of the *Historian.* He wrote, "In 1772 John Cook grocer & druggist was at Front, Salford, but in 1773 he had removed to 12, Market Place where he was described as a druggist and seedsman. In 1778 [now altered to 1788] the business was carried on by Ann Cook, presumably his widow, and after her death the business was sold. After many changes, including a move to 51, London Rd. the business was purchased c.1860 by Thomas Kerfoot ...." This information was obtained from the third volume of *Manchester Streets and Manchester Men,,* page 184 by T. Swindells, a reproduction edition.

One guesses that neither John Cooke nor his wife was particularly well versed in dispensing but confined themselves to selling proprietary medicines and crude drugs.

More Useful Documents.

We are again indebted to the Royal Commission on Historical Manuscripts for information on the where abouts today of historic documents relating to pharmacy. The Commission each year collects information relating to manuscript accessions from over 250 repositories and record offices in the British Isles. This information is then published on the internet via the Commission's web site (http://www.hmc.gov.uk). It is also added to the indexes to the National Register of Archives (NRA) available for public consultation in the Commission's search room in Quality Court off Chancery Lane, London, WC2A 1HP. The Commission will also answer limited and specific postal and e-mail enquiries.

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National, University and Special Repositories.

Edinburgh University Library, Special Collections Department, George Square, Edinburgh. EH8 9LJ.
William Cullen, (1710-90): lectures on chemistry and pharmacy. (MS 3143)

Ironbridge Gorge Museum Trust, Telford, Shropshire TF8 7AW.
H. Foster, chemist, Birmingham: records 19th.-20th. century. (1997.3149)

University of Sheffield Library, Special Collections and Archives, Western Bank, Sheffield. S10 2TN.
Harold Thomas Swan, haematologist: papers relating to clinical use of penicillin. (MS 185)

Wellcome Institute for the History of Medicine, Western Manuscripts, 183, Euston Rd.,London NW1 2BE
John Harley, dispensing chemist, London: prescription books 1885-1926. (Acc. 350774)

Thomas Morson & Son Ltd., manufacturing chemists, London (addnl.): records, photographs, late 19th.c.-20th. century. (SA/MOR)

Apothecary, West Yorkshire: account book, 1703-10 (MS 7500)
Wellcome Institute,Contemporary Medical Archives
Harrods, London, pharmacy: prescription books 1935-77, (GC/214)

Local Repositories.

Cambridgeshire County R.O., Shire Hall, Castle Hill, Cambridge. CB3 0AP.
Flanders, chemists & opticians, Cambridge: prescription and account books, 1880-1962.

Derbyshire R.O., New Street, Matlock,Derbyshire.
Chemist, Clay Cross: records 20th.c. (D4673)

Devon R.O., Castle Street, Exeter. EX4 3PU.
H.W.Stott, chemist, Torquay: prescription books and poisons registers, 19th.-20th.c. (5625)

North Devon R.O., Tuly Street, Barnstable.EX32 7EJ
Boots Ltd., Ilfracombe branch: prescription books, 1926-96, (B483)
Manchester Local Studies Unit, Archives, Central Library, St. Peter's Square, Manchester. M2 5PD.
James Woolley Sons & Co., pharmaceutical supplies records 20th. c. (Misc/1035)

Tyne & Wear Archives Service, Blandford House, Blandford Square, Newcastle-upon-Tyne. NE1 4JA.
Scott & Turner Ltd., manufacturing chemists: deeds of AndrewsHouse,Gallowgate. 1674-1936

Dundee City Archives, Dept. of Support Services, 21 City Square, Dundee. DD1 3BY
A.Y.Barrie, Morgan Tower Pharmacy, Dundee: prescription books and accounts books 1906-57.

Review

A History of the Society of Apothecaries
by Penelope Hunting, 1998, London, Society of Apothecaries, pp.312, 100+ illus., bibliography, index
ISBN 0 9504 9874 2 Price £37-50p.

At least three other histories of the Society have been written, but none has covered the long period from its evolution out of the mediaeval spicers and apothecaries until today when it is a licensing body and awards specialised medical diplomas. It is carefully noted that the Society with its beautiful Hall has a love of ceremony, **but** is not out-of-date.

Not only is its history treated in depth but also in breadth with long and interesting excursions into the background and developments of the physic garden at Chelsea, the establishment of the laboratory for 'chemical' medicines and the ramifications of what it was not too proud to call its 'Trade'.

In a subject so large, one feels it must contain at least its fair proportion of errors but happily these are remarkably few. Perhaps the worst from a pharmacist's point of view is the statement that, "T.D.Whittet" was the first pharmaceutical Master of the Society...." (p.235) in 1982-83. More correctly, he was the first one for nearly two hundred years, the first Masters would certainly have been pharmaceutical rather than medical. Curiously, far from trying to strengthen the common history of the two, now separate, professions Dr Whittet tried to maintain the Apothecaries' pharmaceutical origins by actively supporting the Apothecaries' Hall dispensers' examination.

A mere slip of the pen is that the Chelsea garden was the **second** physic garden "...to be established in England after Oxford.", (p.117) it was the **first**, the words ' in England' or 'after Oxford' should not have been added. It seems almost certain that Edward Morgan of the Westminster garden returned to North Wales and as late as 1684 was at Bodygallen near Aberconway.(p.276) The First Fleet arrived at Sydney Cove, Australia on 26 January 1788 (p.181, not 1787) and the most recent and careful work on Thomas Arndell (who was not connected to the man in the British army) has been done by Marjorie Raven and John Harnden. (p.285) These are but pin-pricks.

The book has been given much thought, references are excellent with helpful page numbering, well placed illustrations and a good index. In fact, **good value.**

J Burnby

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John Gerarde and his Contemporaries.

Dr J. Burnby

Any work on the early years of John Gerarde is much hampered by two disasters which occurred in Nantwich, Cheshire during the 16th. century. Firstly, the pages of the parish register have been torn out from May 1545 until 1572, and secondly, there was a devastating fire, destroying much of Nantwich, on the night of 10 December 1583. All we know is that there were no Gerardes on the list of those who received help for the restoration of their homes.[1]

We know from his *Herball* that he went to school in Wistaston, even today only a small village a couple of miles from the busy market town of Nantwich. It could however have been no more than a petty school where he would have learnt reading, writing and probably elementary arithmetic.[2] However, it is unlikely that this was his sole degree of education when he went to London in 1562 to be apprenticed to Alexander Mason, a surgeon of recognised competence.

Portrait of John Gerarde

The Barber Surgeons Company in London was formed in 1540 by the amalgamation of the old Barbers' Company, which despite its name had more to do with minor surgery than hair-cutting, and a select, experienced Fellowship of Surgeons. Why this union was made is unknown, but it has been suggested the idea was to elevate the knowledge and expererience of the general mass of those engaged in surgery. In the long term this did not happen, in fact if anything it had the reverse effect; the parallel may perhaps be drawn with the old adage that bad money always chases out good. Nevertheless, just at this period the Barber Surgeons' Company was making great efforts to up-grade the status of its surgical members, and in the years 1555 to 1557 new by-laws were formulated for aspiring surgeons.

Apprenticeship was obligatory, during which time he had to attend the surgical demonstrations and anatomies of the four executed felons allowed to the Company each year. Attendance by both fully fledged members and of the apprentices was compulsory. His seven years of servitude finished, the apprentice then had to satisfy the examiners that he was "well exercised in the curing of infirmities belonging to surgery" in order to gain his Freedom of the Company, then essential for any barber surgeon intent on practising or trading in the City of London.

If he wished to go further and become a Master of Surgery, as Gerarde did, he had to bring in an 'Epistle' every half year and read it himself before the whole Company for them to see how he had progressed. It was even ordained on 22 July 1556 that "every barber surgeon occupying surgery shall take no apprentice but suche as hathe some knowledge in the latten toong."[3] If this had really been enforced then Gerarde must have attended the grammar school at Nantwich which is thought to have been in the old guildhall alongside the church.[4] Certainly he must have had some knowledge of "the latten toong" as we know that he had letters from Lobel in that language.[5]

There is no reason to suppose that all barber surgeons were ignorant butchers. A not inconsiderable number were well read and a few were authors, as for example Thomas Vicary, first Master of the joint Company who wrote at least two books. Then there were John Banister who lectured on the anatomical work of Realdo Colombo, as well as Gerarde's two friends, Thomas Thorney and George Baker.[6] Men as well qualified as Robert Allott (1576-1642), MD (Cantab.) in 1607, did not find it beneath them to be admitted as a brother of the London Barber Surgeons' Company on 3 March 1613/14. Allott had at least two surgical apprentices, one of whom, Arthur Taylor, he recommended should be made Free of the London Company, he "having truly served in his profession."

A surgeon who must not be forgotten was John Woodall (1569-1643) who obtained his Freedom in 1599. He became Surgeon General to the East India

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company in 1612 and five years later published his important *The Surgion's Mate*, in which he emphasised the need for lemon juice to be taken on all long distance voyages as a preventative against scurvy.

The Barber Surgeons' Company held men of all degrees, including those who were by no means poverty stricken. John Gerarde's will of 1612 shows that he left £551 17s. 6d., a fair sum of money in those days, but many were much richer.[7] Joseph Fenton who often worked closely with Gerarde in the running of the Company, at his death in 1634 held freehold property in East Ham and elsewhere, leased a large house and 178 acres in Tottenham from Richard, Earl of Dorset, another house in Little Moorfields and the one in which he lived in St Bartholomew the Less.[8] His friend, James Moulins, lithotomist at Bart's. and Thomas's was equally well placed.

The new lands of the Americas were not the only ones to be discovered and investigated in those heady days of the first Elizabeth. It was a time of exploration, ships went to the West Indies, into the Mediterranean and the Baltic, round the northern tip of Norway to Russia, even as far as the River Ob in Siberia, and at the end of her reign to the Spice Islands of the Far East. Not all could, or even wished, to travel to these distant lands, but began to think that their own country, indeed their own county, was worthy of exploration. William Harrison (1534-1593) wrote his *Description of England*, published in 1577, and William Lambarde (1536-1601) became the first county historian with his *Perambulation of Kent* a year earlier. A third William, William Camden (1551-1623) brought out the first part of his *Britannia* in 1586. John Norden (1548-1625) designed ,but was unable to complete, a series of county histories; Gerarde supplied him with red-beet seeds for his garden at Fulham, and it is even possible that it was Norden who encouraged him to at least attempt to produce his massive *Herball.*

A new attitude towards nature had been developing in western Europe. It first appeared in Italy where the study of plants in physic or botanical gardens was taken up with enthusiasm, and then moved quickly north of the Alps. At first interest was almost entirely confined to their medicinal value but slowly the idea grew that plants were worthy of consideration for themselves.

At the time of Gerarde, there were three men of the Low Countries, Rembert Dodoens (1517-1585), Charles de l'Ecluse (1526-1609) and Mathias de l'Obel (1538-1616) who were rather less interested in the plants' 'virtues' and more in their habitat and the sheer joy of running them to ground. With all three men Gerarde had contact, either directly or indirectly.

John Gerarde developed a wonderful 'correspondence', as it was then termed, with men all over England and some parts of the Continent with whom he exchanged information, seeds, roots and sometimes plants. To mention only a few, there were the Royal Apothecaries, Hugh Morgan and John Rich, Thomas Edwards apothecary of Exeter, William Gooderous, Sergeant-Surgeon to the Queen, (whose son by the way was a professional gardener), James Harvey, merchant, and Thomas Grey, apothecary, both of whom lived in Lime street, London, also the home of James Garret, apothecary, and Dr Mathias de l'Obel for many years.

There were also his fellow surgeons, John Bennet of Maidstone and Robert Cranwich of Much Dunmow, and of course his close friend William Martin who lived nearby. Amongst the physicians he mentions were Timothy Bright of Barts., Thomas Penny, William Turner, Isaac de Laune, brother of the well known Gideon, and de l'Obel.Then there were the merchants, Nicholas Leate of the Turkey Company, and the two John de Franquevilles refugees from France, and even men of such eminent position as Lord Edward Zouche and Richard Garth, First Secretary to the Chancery.

In some ways his most important contacts were those with the apothecaries, the two James Garretts, father and son, and another son Peter. All had a keen interest in botany and, what is more, retained close connections with their homeland in the Low Countries, even to the point that Peter lived in Amsterdam for a long period where he ran a sugar refinery. All of them were close friends of that most eminent of Flemish botanists, Charles de l'Ecluse or Clusius. Through them and Jean Robin of Paris, Gerarde was brought in contact with developments in France and the Netherlands, for agriculture and horticulture in those lands were in advance of England.

John Gerarde was not living in a sea of intellectual isolation even if he were, as he modestly said, "but a country Schollar"; and indeed he not infrequently gives the names of plants in a number of languages such as German, Latin or Italian.

There can be no doubt that his *Herball* inspired a whole generation of men with an interest in plants. William Coys of Stubbers, Essex, was such a one and used Gerarde's *Catalogus* reprint of 1599 to identify his plants.[10] Coys in his turn enthused John Goodyer of Mapledurham. If such an atmosphere of enthusiasm had not come about would Thomas Johnson the apothecary have ever set out on his expeditions into Kent and Middlesex in 1629 with a number of his fellow apothecaries? Three years later, enthusiasm still running high much the same party visited the south coast and the west country.

It was not only the physic garden which had been

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popularised, but the whole art of gardening. We know that the Lord Treasurer, Burleigh, had put Gerarde in charge of his gardens at Theobalds and in the Strand, and that later Burleigh's ward, Lord Edward Zouche, placed Lobel in a similar position in Hackney. Later still, Burleigh's son, Robert Earl of Salisbury, sent John Tradescant overseas to gather new treasures. The first true book on the delights of gardening was produced by the apothecary, John Parkinson, in 1629 with his much loved *Paradisus*, the first of many to fill our library shelves. He, like Gerarde, expended money on his enthusiasm. Gerarde sent his servant, William Marshall, to be a ship's surgeon on the *Hercules* to gather information and possibly specimens, just as Gerarde had in his own youth, whilst Parkinson paid the Frisian merchant, Willem Boel, to send him seeds and roots from Mediterranean countries.

Certainly John Gerarde must be accorded his place amongst men who have influenced their fellow countrymen, a whetstone as he put it on which others could sharpen their tools. Perhaps most telling of all are the marginal notes of Sir John Salusbury (1567-1612) of Denbighshire who used his copy of the *Herball* to note the Welsh localities of about 20 plants.[11]

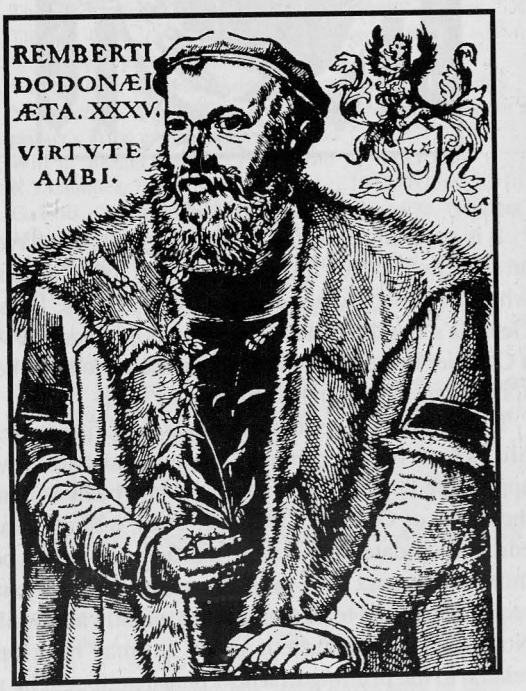
Gerarde has been much castigated for his description of barnacles attached to washed up trees which he believed could produce tiny birds but as Professor Paul Cox of Brigham Young University has written, "If his critics had consulted a marine invertebrate zoologist, they would have learned that the barnacle genus *Lepas* whose species grow on shipwrecks and dead trees is charactersised by a feather-like appendage for filter feeding, and that acorn barnacles have protruding inner plates that resemble bird beaks."[12] This fits very neatly with Gerarde's description.

No discussion of Gerarde can take place without considering the question of his alleged plagiarism of a translation by Robert Priest of Dodoens' last book *Stirpium Historiae Pemptades Sex* published in 1583.

Priest went up to Peterhouse, Cambridge in April 1567, obtained an MA in 1573 and was given a licence to practise medicine four years later. He was awarded an MD in 1580 and became a Candidate of the London College of Physicians in 1582 when he must have been about 32. He was a regular attender of the College Comitia and was listed as a Fellow in 1595 but his admission to fellowship can not be found.

Jeffers wrote that he married Katherine Boyce on 27 April 1584 at St. Peter's, Cornhill.[13] Their first child, Mary, was baptised there a mere eight months later on Christmas Day of that year. Death must have come unexpectedly to Priest as he died intestate and letters of administration were given to his wife in June 1596.[14] They were then living in the small parish of St. Nicholas Cole Abbey, probably in Old Fish Street and only a short distance from the College of Physicians.

The College had first proposed in 1585 that it should produce a pharmacopoeia, an official reference book which was much needed. Nothing more is recorded until October 1589 when a plan was adopted of dividing medicines into certain categories which would be studied by three or four physicians whose conclusions would be reported back to the main committee. One group consisted of 'Extracts, Salts, Chemicals and Metals' at which Thomas Mouffet of *Theatrum Insectorum* fame worked, and another was 'Syrups, Juleps and Decoctions'. Two members of the latter group were Lancelot Browne (one of Gerarde's commendors in the preface of his *Herball,* as were William Delaune, father of Gideon, and Francis Herring of the main committee) and Dr Robert Priest[15]. The work involved was considerable and Priest must have been a busy man if he was already translating Dodoen's book. For the furtherance of his career the work on the pharmacopoeia was undoubtedly the more important of the two tasks, and possibly the translation was set aside for a time.



Portrait of Rembert Dodoens

One can not but feel that Gerarde, a man still working as a surgeon and superintending three gardens, his own and two of Burleigh's, would have had to work fast to extract the manuscript from Priest's widow, re-arrange the order in which it was written by using Lobel's system based on the leaf, place the illustrations

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obtained from the Continent in what was mostly, but not always, in the correct position, add his own new material and register it with Stationers' Hall by June 1597 - just one year after Priest's death. Nor must it be forgotten that the *Herball* is nearly 1400 pages long.

Blanche Henery has pointed out that Gerarde did not need Priest's partial translation of the *Pemptades* as it was largely a collection of his earlier published material. The evidence for plagiarism is not great, in the end coming down to the accusations of two people, Mathias de l'Obel and Thomas Johnson.

Matthias de l'Obel

It is generally agreed that Johnson did not behave in an attractive fashion towards his friend John Parkinson who was known to be planning a book on the lines of Gerarde's, but this did not weigh with Johnson. He was a Cavalier in the Civil War, and he seems to have been somewhat cavalier in his attitudes as well.

The Society of Apothecaries was only fifteen years old when its member, Thomas Johnson, was approached by the three men who had been assigned the rights of Gerarde's *Herball*. They wished him to edit and up-date it, and were confident it would be a money-spinner. The book however was urgently required and had to be finalised as quickly as possible No reason for the haste is given but may have been related to the printing of a new pharmacopoeia by the College of Physicians. Johnson, a man of known botanical ability with experience in publication, was willing to oblige.

In 1632 the Society of Apothecaries was not in a very happy state. It would have applauded one of their members taking on such an important task; perhaps it had even initiated the idea. The quarrels between it and the College of Physicians were reaching a dangerous level and the Society had a great need to show that it was a serious, responsible and well-informed body. In particular the Society wished to show the physicians that it had an excellent and up-to-date knowledge of plants and their uses, and furthermore that the barber surgeons could not be regarded as serious rivals. The Apothecaries had found it particularly unfortunate that the College had made Gerarde curator of their physic garden, even though it apparently never materialised, any more than that of the Barber Surgeons which had been another of Gerarde's ideas.

The new edition of the *Herball* was presented to the Apothecaries' Society on 28 November 1633. It was received with great, and justified, acclamation, so much so that Johnson was promptly elevated to the Livery (though not without some opposition from Mr Rand). Furthermore he did not have to pay his livery fine and he was even given his livery gown and hood which were by no means cheap.[16] One might well think that the Society was somewhat over-reacting.

Likewise one may wonder how the new editor had produced this even larger tome of 1,630 pages in such a short time, but found sufficient space and time to destroy John Gerarde the barber surgeon's reputation. Clearly he had already accumulated much botanical knowledge in his travels as well as receiving considerable help from fellow apothecaries, his friends George Bowles (grandson of Gerarde's staunch friend George Baker) and John Goodyer which Johnson ackowledges.

John Parkinson openly acknowledges that he had bought Lobel's manuscript of *Stirpium Illustrationes* after Lobel's death in 1616, and that he had used it in his own *Theatrum Botanicum* of 1640. It is also known that Johnson's friend and helper, John Goodyer, was a collector of manuscripts and that he had obtained those of de l'Obel including the second edition of his and Pena's *Adversaria*. Did either Parkinson or Goodyer lend it to Johnson, so helping him to extend the list of new plants - and at the same time the opportunity of reading Lobel's libellous remarks about Gerarde which Johnson did not hesitate to reproduce and embroider.?

As for de l'Obel, why did he develop this hatred of John Gerarde ?

Well he has been accused of being an arrogant man and he would certainly not have cared for a barber surgeon challenging him on his identifications, even perhaps refusing to accept some. Lobel was primarily a French speaker, and it is possible that his English idiomatic speech was not good, just as Gerarde said, but he would not have liked being so told.

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Then there was the question of titles which probably irritated Lobel even more. In August 1603 Gerarde was named in a document 'Surgeon and Herbarist to the Kinges majestie', whilst in 1607 as a result of his patron, Lord Zouche's good offices, Lobel was granted the title of 'Botanicus Regius'; a resemblance which was too close for a petty man.

Was Lobel really a man of 'sterling honesty' as Plantin wrote ? [19]

The Overbury poisoning trial of 1615 has been written about on a number of occasions, but one feels there is more to be known. Lobel's son Paul, an apothecary in Lime Street, had supplied Overbury with his medicines when in the Tower of London. Edward Ryder who had gone with his mother to collect the rent from Lobel and was all agog to discuss the case with one so closely connected, both on this occasion and a week later when they met near the Merchant Tailors' Hall.

On the second occasion, Ryder blurted out that it was now certain that Overbury had been poisoned by an apothecary's apprentice in Lime Street who had since disappeared. Mrs Lobel at once turned to her husband and said in French, "That was William who you sent into France". Lobel was visibly very disturbed. [20]

The apprentice's name was said to be William Reeve who when ill in Flushing had confessed to having been bribed to administer a poisoned enema. The confession was conveyed to Trumbull, the British Resident in Brussels who communicated it to England. Anthony Weldon who wrote of the Court of James I, claimed that Reeve returned to England and set up as an apothecary.

A William Reeve who was an apothecary certainly existed and was not a figment of either William Trumbull's or Anthony Weldon's imagination. Records show that a Guillame Rivius, later called William Reave, was in this country within two years of the trial, that he had come originally from Wesel in the Duchy of Cleves, that he was an apothecary and was living in Lime Street ward in 1618.[21]

None of this necessarily implicates either Lobel or his son in a murder, but they were certainly withholding evidence and knew more than was good for them, even if Lord Zouche, Lobel's patron of many years, was one of four Commissioners making the investigations.

Mathias de l'Obel died only a few months after the trial, in the parish of St. Michael's, Cornhill but was buried in the church of St. Dionis Backchurch according to that parish register, and not at Highgate as is always written. Only four years later, his son was buried in the same church, his will, written in French, shows he was not a rich man.[22]

So one is able to make suggestions as to why John Gerarde could have had two men who were pleased to vilify him, but one thing is sure neither could write in the beautiful Elizabethan English of which he was such a master, "... for floures through their beauty, variety of colour, and exquisite forme, do bring to a liberale and gentle manly minde, the remembrance of honestie, comlinesse, and all kindes of vertues...."

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2. J.A.Morris, *A History of the Latymer School at Edmonton,* 1975, Latymer Foundation, p.21-2.
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5. Gerarde 'Englished' this Latin letter from Lobel.
6. William Clowes,*Profitable & necessarie booke of observations,*(1596) and *A brief treatise of Morbus Gallicus*, (1585).
   Thomas Vicary, *The Anatomie of the Bodie of Man..*
   Thomas Gale, *Certain works of Galens* (1567)
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8. Will of John Gerarde, Archdeaconry, Guildhall Library. Note:Gerarde signed his name with a final 'e, it was not a printer's error as has been suggested.
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17. Apothecaries' Society Court Minutes and Accounts, MS 8200/1, MS 8202
18. C.E.Raven, *English naturalists from Neckham to Ray,* 1968 re-print, Kraus-Thomson, USA, p.206
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20. Lobell's first wife died July 1605. Raven says he then married the mother of Abraham Hugobert. See Raven, p.236.
21. R.E.G. Kirk, *Returns of Aliens in London, 1523-1603,* Huguenot Society, Vol.10 in 3 parts +index, part 3, pp.163, 179, 209.
22. Commissary Court, Guildhall Lib., 1621, Reg. f. 530. Paul de Lobell was apothecary to Theodore de Mayerne, Overbury's doctor when he was in the Tower. Lobell has been thought to be married to Mayerne's sister but he gives his wife's maiden name as Joane du Jardin.

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Martindale: The Men and the Books

by Ainley Wade

Formerly General Editor of Scientific Publications
Royal Pharmaceutical Society of Great Britain

What makes Martindale such a potent name in pharmacy around the world? This article tells something of the Martindale family and how the father and son came to start a series of books now in their 115th year and about to publish a 32nd edition. They also founded a business which lasted 60 years and lived on in Savory and Moore. In the last few years it has been reborn as Martindale Pharmaceuticals.

The story has been told several times over the years and I am indebted to earlier writers, including Roy Capper (1952),[1] Douglas Whittet (1953),[2] Kenneth Fitch (1968)[3] and the last editor of Martindale - James Reynolds (1983 and 1990),[4,5] for much of the information.

Martindale is the name of a valley to the Southeast of Ullswater in Westmorland. It has a few farms and two churches from the 17th and 19th centuries. The family name Martindale is still known in Cumbria but has also spread far and wide. The Martindale family of interest were tenants and owners of various farms in Cumberland between Penrith and Carlisle in the late 18th and early 19th centuries. The William Martindale who came to make his fortune in London is shown on the abbreviated family tree (Figure 1). The main sources for this are a family bible (actually a New Testament)[6] starting with Isacc [sic] Kirkbride, birth, marriage and death certificates, parish records and census returns.

William Martindale's early years

In 1840 William was the sixth of eight children to be born to Richard and Charlotte Martindale. His birthplace at High House Farm in the township of Peveril Crooks in the parish of Hesket-in-the-Forest, Cumberland now lies alongside the M6 motorway near Southwaite service station south of Carlisle. Little is known of his childhood but his obituary said that he was educated at a private school in Carlisle.[7] His family no longer lived at Hesket in 1851 and by 1861 were living at Stainton, NW of Carlisle. Most articles on Martindale[8,9] have repeated the story that he was born at Stainton, but his birth certificate and the 1841 census prove that this is not so.

In 1856, William was apprenticed to his uncle, in fact a great-uncle, William Robinson Martindale,[10] who ran the business of Martindale and Son, Chemist and Druggist, at 4 English Street in the Market Place at Carlisle. Unfortunately his uncle, who was not recorded as a member of the Society, died in 1858, bringing William's apprenticeship to a premature end. He was then apprenticed to Andrew Thompson, another chemist and druggist in English Street Carlisle. In the 1861 census William was living at Stainton with his family: father Richard, a farmer of 160 acres, with 2 men and a boy, mother Charlotte, sisters Elizabeth, Jane and Mary Ann, and younger brother Richard. Stainton was then a hamlet in the parish of Stanwix on the north side of Carlisle, near where Hadrian's Wall crossed the river Eden.

William Martindale in London

In 1862, after completing his apprenticeship and at the age of 22, he went to London. Professor Trease[7] recorded[9] that formal study was not easy in the provinces and that many men went to London to study for the Society's new examinations. Good pharmacies in London found it easy to obtain cheap and highly skilled labour. Martindale's health was not good at the end of his apprenticeship and he spent some time on the south coast before starting work in London.

He worked from 1862-64 as a chemist's assistant at James Merrell's pharmacy at the top of Camden Road, on the corner of York Road, in what was then a fairly fashionable suburb. In an article to celebrate Merrell's centenary in 1952 the *Chemist and Druggist*[11] claimed that Ellen Terry, who lived in the house opposite, was a customer, and so was Dr William Wynn Westcott who lived first at Torriano Avenue then in Camden Road. The most famous customer was Dr James Crippen (1910). The prescription books for the 1860s were available in 1952 and showed William Martindale's neat handwriting. The building still exists, with its distinctive Corinthian columns, but is in decline and disfigured by an advertisement hoarding.

William studied at the Society's college (the Square) under Professors Attfield and Redwood. He passed the Minor exam in 1864[12] and the Major in October 1866.[13] He moved to Morson's pharmacy in Southampton Row as a qualified assistant and worked there from 1866 to 1868. T.N.R. Morson was on the Council of the Society and had been President in 1859-61. The pharmacy was of course just a short walk from the College in the Society's House at 17 Bloomsbury Square.

In 1868 he became the first pharmaceutically qualified Dispenser at University College Hospital,[2] the teacher of pharmacy to the medical school and a demonstrator in materia medica at University College.[7] Roy Capper's lecture on Martindale in 1952[1] told how the idea for the *Extra Pharmacopoeia* was born

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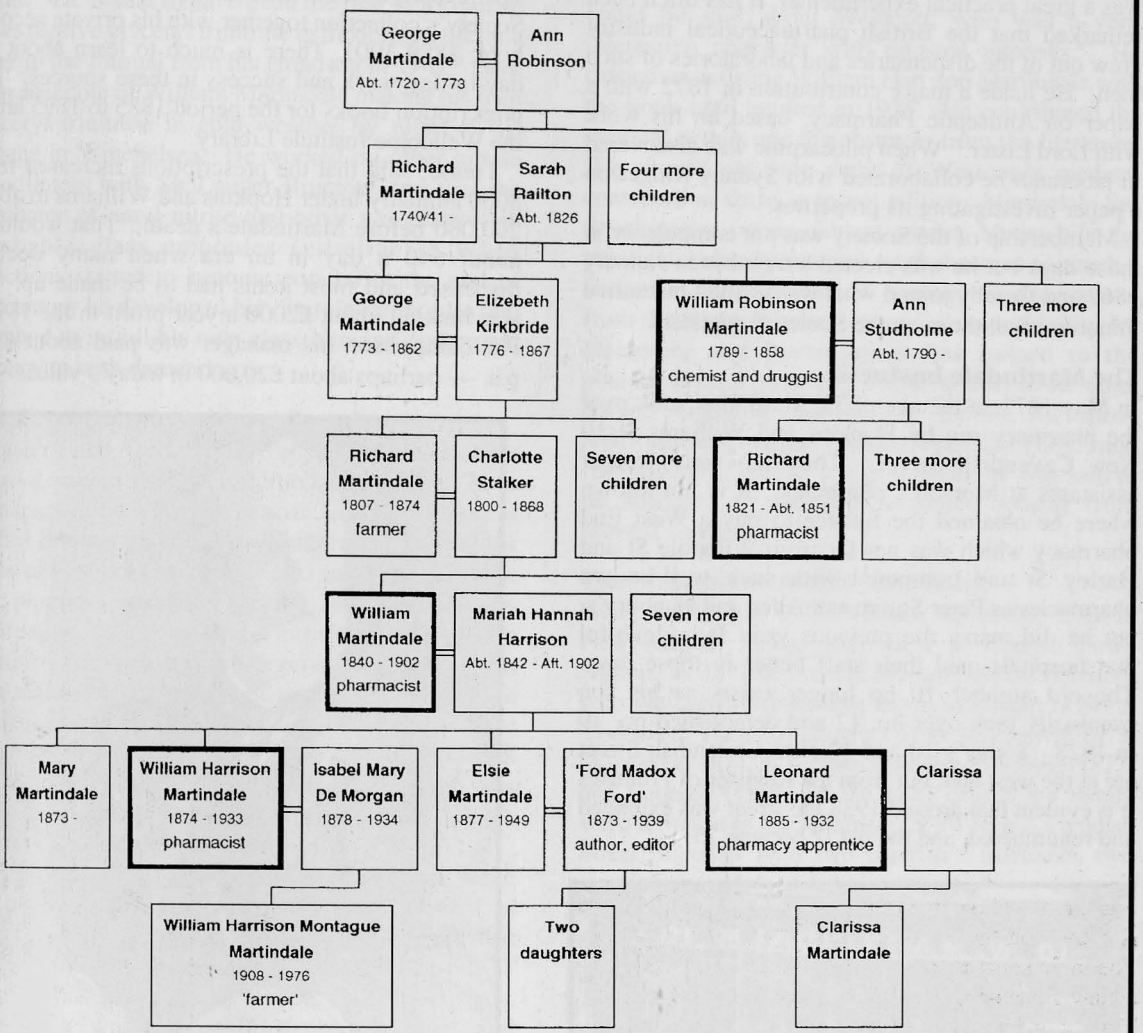
Family Tree of William Martindale



while he was at UCH. It was there that he became very friendly with Dr (later Professor) Sydney Ringer FRS (1835-1910), famous for his work on the effects of the electrolytes in body fluids. In 1872 Martindale edited the UCH pharmacopoeia.

In those days the Pharmaceutical Society's Council meeting on the first Wednesday in the month was followed by an evening pharmaceutical meeting of a scientific and practical nature. From 1867 reports of Martindale speaking at these meetings can be found in the pages of the *Pharmaceutical Journal*. Martindale joined in a discussion on the preparation of suppositories and pessaries to report that he had found a mixture of glycerin and soft soap a good lubricant application to the moulds.[14] At the next meeting in December 1867 there was a long paper and discussion on Norwegian Cod Liver Oil. Mr Martindale noted that the Norwegian Pharmacopoeia allowed the liver of several species of cod to be used in the preparation of the oil.[15] These interventions continued: when his teacher Professor Attfield spoke on problems with the adulteration of Milk of Sulphur, Martindale joined in to say that the product was first included in the London Pharmacopoeia of 1721.[16]

Martindale presented a paper himself in 1868 on the new Carbolic Acid Plasters developed by Professor Lister to counteract germs (the latest theory at that time).[17] Lister at first used a kind of carbolic putty but Martindale instead modified the standard lead plaster to incorporate the phenol and

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produced a plaster that stayed pliable on storage. In these public reports one can already recognise the essence of Martindale's genius. He already had a thorough knowledge of pharmacopoeias and he was a great practical experimenter. It has often been remarked that the British pharmaceutical industry grew out of the dispensaries and laboratories of such men. He made a major contribution in 1872 with a paper on Antiseptic Pharmacy, based on his work with Lord Lister.[2] When pilocarpine was discovered in jaborandi he collaborated with Sydney Ringer on a paper investigating its properties.[2]

Membership of the Society was not compulsory in those days but he was elected a member in January 1869 and thereby joined what was a small but active minority of all those on the Society's registers.

The Martindale business

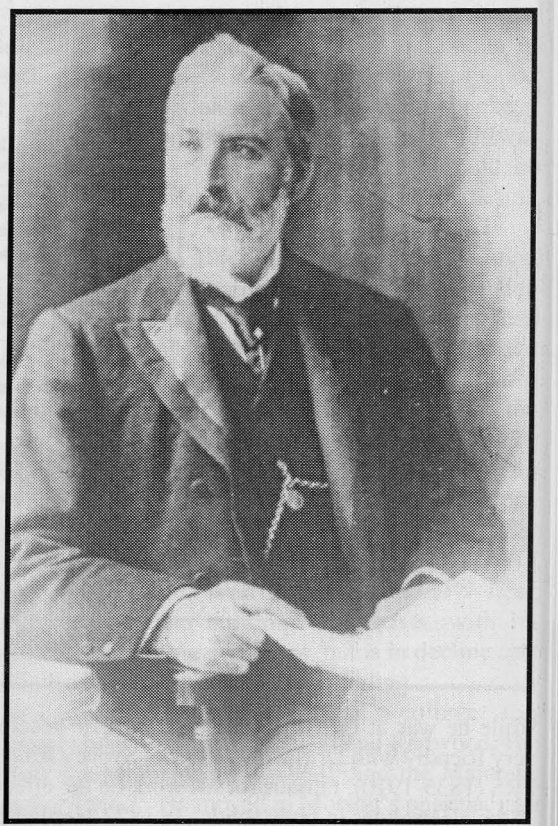
In May 1873, at the age of 33, Martindale took over the pharmacy run by Hopkins and Williams at 10 New Cavendish Street. They too were former assistants at Morson's pharmacy. It is not known where he obtained the finance to buy a West End pharmacy which was not far from Wimpole St and Harley St and competed with such well-known pharmacies as Peter Squire and Allen and Hanbury's, but he did marry the previous year. It is doubtful that hospitals paid their staff better in those days. The old number 10 no longer exists as his son eventually took over no. 12 and demolished no. 10 in 1928. Today's 10 and 12 New Cavendish Street are at the west end, but from the Register of Premises it is evident that around 1938 the street was extended and renumbered, and the old 12 became 75.

The premises of William Martindale at 10 New Cavendish Street W1

Though taken over by Savory and Moore, the name W. Martindale remained in the Register of Premises until 1971. It is on the north side of the street, just to the east of Portland Place. In 1992 the ground floor premises were occupied by a hairdressing business. The interior bore just a faint resemblance to a photograph of the interior shown in the Chemist and Druggist in 1933.[18]

From 10 New Cavendish Street Martindale transformed the business into one of the most important and scientifically advanced in London. He also developed a considerable analytical business. The prescription books from 1896 to 1931 are in the Society's collection together with his private account book 1889-1901. There is much to learn about his day-to-day work and success in these sources. The prescription books for the period 1885 to 1895 are in the Wellcome Institute Library.

Trease[9] said that the prescriptions increased from 8000 annually under Hopkins and Williams to about 200,000 before Martindale's death. That would be about 640 a day in an era when many doctors dispensed and most items had to be made up. He was making about £2000 a year profit in the 1890s. For comparison his manager was paid about £180 p.a. — perhaps about £20,000 in today's values.



William Martindale 1840-1902

Martindale's activities

In 1873 Martindale became an examiner for the Society and served for 10 years. He was elected to the Society's Council in 1889 and became treasurer in 1898, then President for the year 1899-1900.[7] He was a keen supporter of the British Pharmaceutical Conference from 1869 and served as Chairman of its Formulary Committee and President in 1892 and 1896. He was also a Fellow of the Linnean Society and the

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Chemical Society, a member of Council of the Royal Botanic Society and a member of many other societies.[19]

Martindale was an inventor and developer of dose forms.[2] He is said to have been the first to formulate the explosive glyceryl trinitrate in theobroma oil. In a letter to the Journal from his grandson in 1941[20] there is an anecdote of William Martindale making his own glyceryl trinitrate in cold weather by night at his cottage in Winchelsea. He worked on other nitrate vasodilators with Sir Lauder Brunton[2] and was the originator of amyl nitrite and other vasodilators in crushable glass ampoules (vitrellae).[18] When injections started to become popular at the end of the century he developed his 'Sterule' ampoules and then had to install his own glass-blowing equipment to keep up with demand.

The *Extra Pharmacopoeia*

Kenneth Fitch, former editor of the *Pharmaceutical Journal*, said in 1969 that Martindale published 70 to 80 papers in the *Pharmaceutical Journal*.[3] There is no full bibliography though Whittet[2] and Trease[9] list many of the titles. Martindale also answered scientific and practical questions for the *Journal* and it is recorded that the notes which formed the basis of the *Extra Pharmacopoeia* were largely based on his work for the Dispensing Memoranda, while the plan of the book was suggested more or less completely in the course of long conversations in the editorial sanctum of the *Journal*.[1] The first edition of the book was published in 1883 when William was 43 and with the assistance of Dr Wynn Westcott.

The Extra in the title was used in its classical sense of 'outside' as Martindale and Westcott aimed to describe the drugs that were outside the *British Pharmacopoeia*. From a slim pocket volume of 313 pages it has grown to its current 2000 plus pages. The book was successful from the start and Martindale had produced a 4th edition by 1885. These were not the complete revisions of today's editions but updates based on his latest research. He produced a supplement on cocaine for the third edition in 1884 after news of its use in ophthalmology appeared. He soon included the drugs already in the *B.P.* to make his book more comprehensive. William Martindale produced 10 editions with Westcott up to his death in 1902. The most extensive review of the changes in the content of the books was given by Roy Capper in a lecture to the Pharmaceutical Society over 45 years ago when the 23rd edition was published.[1]

Why was the book so successful? Martindale worked in the heart of the medical West End and learned of any new treatments. He solved the dispensing problems of new treatments and published his results so that his book was ahead of the needs of pharmacists.

Dr Wynn Westcott

Martindale had as collaborator Dr William Wynn Westcott, aged 35 at the time of the first edition and a coroner in Northeast London. There is much that could be said about Westcott, who was a very interesting character with unusual interests.[4] He carried on assisting William Harrison Martindale with the book until he died in 1925. He contributed the medical details and the abstracts from the literature. We should not lose sight of Westcott's medical contribution since in recent editions Martindale has developed a more clinical aspect. Meanwhile the practical and experimental work that was so much a feature of the Martindales' writing has disappeared from the *Extra Pharmacopoeia* as responsibility for discovery and development has passed to the pharmaceutical industry. Westcott also wrote other books, including '*Suicide: its history, literature, jurisprudence, causation and prevention*' (1885) and '*On suicide*' (1905). A trivial point: he was said to be addicted to menthol lozenges bought from Merrell's pharmacy.[11]

The Martindale family and home

While working at UCH William Martindale lived in New Kentish Town, quite close to Kentish Town Station. In 1872 he married Mariah Hannah Harrison, who was born into a farming family at Rokeby in North Yorkshire. Their first daughter Mary was born in 1873, followed in 1874 by William Harrison, then Elsie (1877) and Leonard (1885). In the 1881 census the family were living over the pharmacy at 10 New Cavendish Street, together with two chemist's assistants, two apprentices and three female servants.[21]

Little is known about Mary or Leonard, but Elsie Martindale seems to have had an exciting life and appears in the *Dictionary of National Biography*.[22] At the age of 17 she eloped with a young writer. Her father had her made a ward of court, and sent private detectives to pursue the couple. She married the writer in 1894, but her father had the writer Ford Hermann Hueffer committed for contempt of court. She had two daughters by Ford, who was the son of Dr Franz Hueffer, a naturalised German and music critic of *The Times*. Ford's mother was Catherine Brown, a daughter of Ford Madox Brown, the noted pre-Raphaelite artist, and her sister was married to William Rossetti.

Ford Hueffer wrote biographies, poems and novels and was associated with the earliest works of D.H. Lawrence. He started the *English Review* in 1908 and published work by Galsworthy, Wells, James and Hardy.[22] He collaborated with Joseph Conrad on three books.[23] After the First World War he changed his name to the better-known Ford Madox Ford and wrote a series of novels popular in the 1920s. By 1910 he had left Elsie Hueffer who sued her husband for restitution of conjugal rights, just the sort of case

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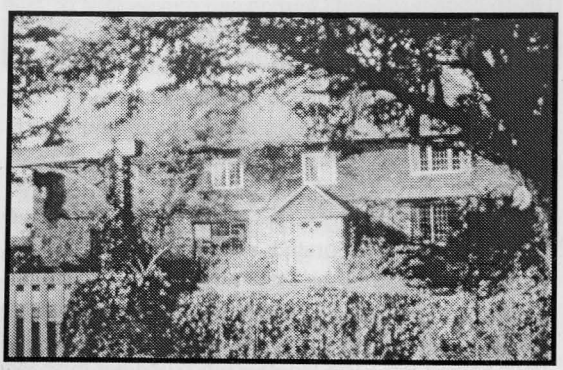
to attract the press. Later she successfully sued the *Throne* newspaper in 1931 for describing Miss Violet Hunt as 'Mrs Ford Madox Hueffer', which caused much publicity and is said[22] to have had an unhappy effect on Ford's reputation. Elsie Hueffer died in 1949. There is evidence that Martindale made loans to Ford when he was a struggling writer and editor.

Leonard went to Uppingham School and was apprenticed at 10 New Cavendish Street, but does not appear to have registered as a pharmacist. He died in September 1932, before his parents. Mary Martindale was alive in 1934.

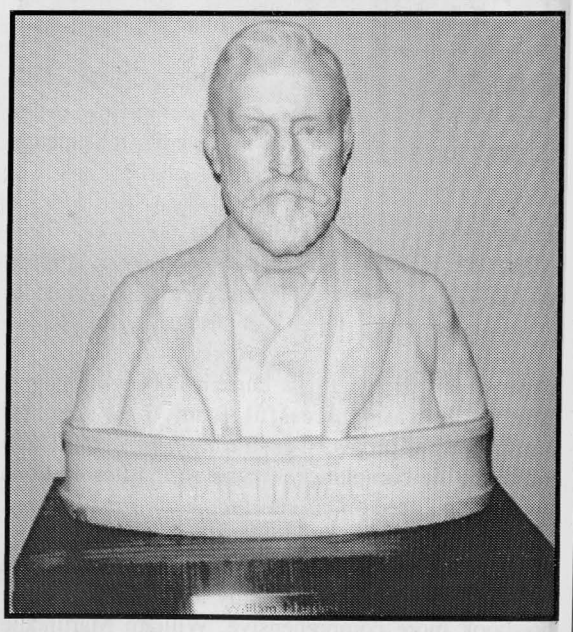
At some stage before 1890 William Martindale bought his 'country cottage' and some land at Winchelsea in Sussex. The house has not yet been identified, though it is said that Ellen Terry lived nearby in Tower Cottage and that the house can be seen from the graveyard. Martindale became a Freeman of Winchelsea, a Jurat, then Mayor and a Baron of the Cinque Ports in 1893.[7] He then bought The Elms Farm House nearby at Icklesham. In the 1890s he published a slim book on coca and cocaine.

Even as a young man William Martindale suffered ill-health. A president of the Society (Atkins) who remembered meeting him at his first British Pharmaceutical Conference in Exeter in 1869 recalled, that he was sickly and walked around with a respirator on. Martindale was elected to the executive committee of the Conference at that meeting[19] and twice acted as President of the Conference. He was first elected to the Council of the Pharmaceutical Society in 1889 and usually came top of the poll. He took over as Treasurer of the Society in October 1898 when Robert Hampson resigned due to ill-health, and became President for a year the following June (1899-1900). However, his own health was poor and he travelled to the West Indies in 1899 and to South Africa in 1900 for recuperation. He was chairman of the local Conference committee for the BP Conference held in London in 1900. He worked for the *British Pharmacopoeia* 1898 and assisted the Privy Council's Poisons Committee considering Schedules of Poisons from 1901 to his death in 1902.[1]



The Elms Farm House, Icklesham, Sussex in 1990

He was so eminent and successful in many fields that it came as a severe shock when on 2 February 1902 he was found dead in his study at 19 Devonshire Street Wl. At the inquest 3 days later his son Dr William Harrison Martindale reported[24] that his father had always been a great worker and had been in fairly good health recently, though suffering from nervous depression caused by overwork. His father had thrown out hints but they never thought he would do anything. Having gone to bed on the Saturday night Martindale went down to his study at 7.35 a.m. The maid found him ill and his doctor, Professor Sydney Ringer, was called but found him dead. A bottle and glass contained prussic acid, and a note to his wife complained that his fagged brain did not permit him to grasp his work. There was an implied criticism of the family at the inquest for not taking his hints seriously, and the verdict was suicide while the balance of his mind was disturbed by overwork. (And we think that stress is something modern.) It came as a shock to find, while researching the family tree of the Martindales, that William's father Richard, who died in Stainton near Carlisle in 1878, also took his own life by cutting his throat.



Marble bust of William Martindale

The Martindale Memorial

After Martindale's death there were immediate proposals to start a memorial fund under Michael Carteighe.[25] Subscriptions came from all over the world and Mr Frank Taubman was asked to sculpt a marble bust from the clay model he exhibited at the previous year's Royal Academy.[26] (Mr Taubman and his father were pharmacists and worked for Morson's. Taubman had trained as an assistant with Martindale

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but turned to sculpture in Paris and Chelsea.)[27] The bust is now on the 4th floor of the Society's building, at the entrance to the Martindale editorial office. Funds for a Martindale medal in perpetuity were presented to the Society with the bust.

What was William Martindale like? Naturally, the tributes to such a man were rather fulsome and more than 95 years after his death there is nobody alive who knew him. A view nearest our time came from Harold Deane of Sudbury, who was a leading pharmacist in the 1950s. At Dr Capper's lecture in 1952,[1] Deane, who served his apprenticeship with William Martindale in the 1890s, described him as 'a handsome man with a very fine presence'. He always wore a frock coat and a silk hat and this in itself impressed doctors who consulted him. The *Journal*'s obituary[7] described Martindale's last 20 years as an unbroken record of labour and worry. Although he was very successful, absolute rest was unknown to him. He was conscientious and painstaking over apparently insignificant points. Hasty and impatient at times, he was good-hearted and made prompt amends for seeming injustice. He was not a born leader of men though the *Chemist and Druggist*[19] described him as easily the prince and leader of pharmacy and said that he was better suited to the art of pharmacy than the worry of politics.[14] He was more a student than a statesman. He had a carefully arranged collection of drug jars and antiques and kept all his letters from his youth. He was generous in private and a perfect mine of information. He was extremely earnest and said to be a 'physician's pharmacist'.[28]

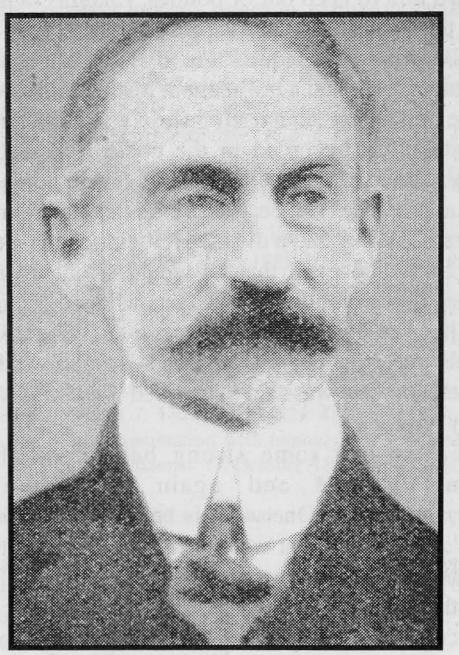
When the bust was unveiled in 1903, Carteighe said that his reputation was more widely known over the whole civilised world than any other pharmacist, even Barnard Proctor.[26] He was the *beau ideal* for the young pharmacists of his generation[29] — in today's sociological jargon he was the role model.

Dr William Harrison Martindale

William Harrison Martindale was born above the shop at 10 New Cavendish Street. He went to University College School and was apprenticed to Mr Charles Allen of Kilburn, who became Vice-president in 1900-03 and President 1911-13. He worked for a short while with Charles Umney, a family friend.[30] He studied at University College, though I have found no record that he obtained a degree there. He went to Marburg University in Germany in 1895 to study under Professor Ernst Schmidt[31] and obtained his MA and PhD for a thesis on corydaline, an alkaloid of *Corydalis,* in February 1898.[32] The same year he passed both the Minor and Major exams and registered as a pharmacist. His father already had cardiac disease and Harrison seems to have started taking over the day-to-day business of W. Martindale.

He married Miss Isabel Mary De Morgan at Kennington Parish Church in August 1901. The interesting guest list is in the Society's collection and one can recognise the bride's family (starting as Morgan from Cardiff and giving an aristocratic 'De' to their children),[33] sister Mary Martindale, brother Leonard Martindale, sister Mrs Elsie Hueffer (but no Ford Hueffer), Dr and Mrs Westcott, Mr Taubman the sculptor and his wife, Mr C. Eustace Wilson their solicitor, and Miss Harrison (a maiden aunt?). These were presumably the closest friends and relatives.

Isabel De Morgan's brother Frederick was also a pharmacist and passed the Major exam ahead of Dr Martindale in 1896. (The Society's Registers show that he was working at 10 New Cavendish Street in 1917-18 and he later had a pharmacy at Wadhurst, Sussex until 1929.) Dr Martindale moved out to Chatsworth Road Brondesbury, then a fashionable area of Kilburn, and built up the manufacturing side of the business. In 1928 he had 10 and 12 New Cavendish Street rebuilt. He also had factory premises built in Chenies Mews, at the back of University College Hospital. From about 1923 he became increasingly deaf and so took a much less prominent part in public affairs in pharmacy than his father. He continued to produce new editions of the *Extra Pharmacopoeia* at 2- to 3-year intervals, with Westcott until 1925 and then on his own. Around 1910 he had produced an analytical addendum and this was developed into Volume II from 1912. Volume II was eventually discontinued after the 1955 edition, but elements were transferred and updated in other Society publications.



William Harrison Martindale 1876-1933

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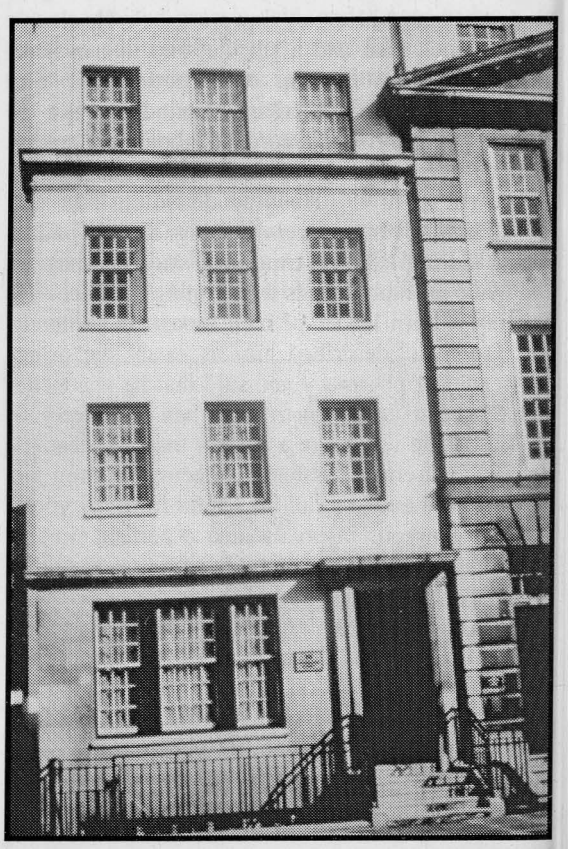
From the 1920s his manager at the business was W.K. Fitch. He estimated that Martindale spent about half his time on the *Extra Pharmacopoeia* and half experimenting on new compounds and formulations in his laboratory.[3] Dr Martindale started to suffer heart trouble and spent more and more of his time at Elms Farm House, Icklesham. His motive may have been to obtain more privacy. James Reynolds' report of a Martindale staff outing to Winchelsea and Icklesham recorded an interview with Dr Martindale's former gardener and with a neighbour whose family sold land to Martindale so that he could walk privately in his own grounds without disturbance.[5] Harrison worked on the proofs of the *Extra Pharmacopoeia* in a summerhouse and sent corrected proofs back to his manager Fitch or his secretary S.L. Ward to check and send to the printer. Kenneth Fitch left Martindale to work on the *Pharmaceutical Journal* in 1930 and became its Editor in 1933. He gave an illuminating account of the two Martindales to the BSHP in 1969, but it was not published until the centenary of the first Extra Pharmacopoeia in 1983.[3]

Dr Martindale completed his last edition (volume I of the 20th) in October 1932 and at the age of only 58 died in April 1933 of heart failure after a severe illness which lasted three weeks. His obituary in the *Journal* commented on his enormous energy and how the time and work spent on completing the 20th edition shortened his life and was responsible for the breakdown in health which followed its publication.[30]

How did William Harrison (known as Harri to his family but W.H.M. to his staff) compare with his father? Both had cardiac problems and his increasing deafness caused him to keep out of politics. Like his father he held the offices of Jurat, Mayor of Winchelsea in 1924 and Baron of the Cinque Ports. By nature he was shy and aloof.[3] He had a brilliant but restless mind which cause him to start an amazing variety of experimental investigations, recorded in the books. He regarded the Victorian era as the acme of civilisation, and his own appearance (tall, bearded) and mode of dress with high stiff collars had a distinctly Victorian air. It was said by A.J.V. Field that he would sit in his glass-fronted office in full view of callers who would be told that he was 'out'.[1] He wrote semi-autobiographical novels under the pen name 'Trinda' which would be of interest.[3] One was said to be titled *The Fantasies of a Shy Man*.

He also had some strong beliefs which he promoted time and again in the *Extra Pharmacopoeia*. One was his belief that 'British is Best': he insisted that whenever possible everything he bought should be of British manufacture. Fitch said that his patriotic zeal went far beyond preaching 'my country, right or wrong'. His burning patriotism and dislike of the German industry was shown in the Prefaces of his 10 editions, where he always pleaded for his readers to support British industry, British scientists, British research, and the 'British way of life'. The Preface of his last (20th) edition comments on the great depression of the Thirties and how British industry had been damaged, leading to bitter and internal competition. He had no time for officialdom and had major disputes with the Home Office over the storage of Dangerous Drugs under the Act of 1920.[3] In an appreciation in 1933 his friend Sage said that "he was a Christian gentleman who believed that his work was for a purpose".[34] Harrison's last words to Sage just before he died were "Our work isn't finished. Carry on. Carry on."



19 Devonshire Street, W1 in 1992
William Martindale's home at his death in 1902

Commentators said that neither of the Martindales was interested in money, being more interested in high professional standards. Yet William Martindale left £15,650 in his will in 1902 and his son £23,500 in 1933. Then what happened? Why did Dr Martindale make no provision for the future of the business, such as taking a partner or finding a joint author for the book? The Martindale family must have been devastated by the death of his younger brother Leonard in 1932, Harrison in 1933 and his wife Isabel a year later.

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The disposal of the Martindale business

There was no pharmacist to carry on the family business or write the book. Fitch said that the Pharmaceutical Society was concerned that the Extra Pharmacopoeia, which had had such an effect on the prestige of pharmacy, might fall into commercial hands. It was also, of course, a competitor to the Society's *British Pharmaceutical Codex*, the largest-ever edition of which was due out in 1934. By this time Fitch was editor of the *Pharmaceutical Journal*. He reported in a leading article in December 1933 that the Society had purchased all the rights of producing and selling the *E.P.*, together with existing stocks, from the executors of the late Dr Martindale.[35] Fitch referred back to the conception of the *E.P.* in the Journal editor's office in the 1880s and commented that it should be a source of gratification to pharmacists that after 50 years the editing and publishing should be taken over by the Society, to which it owed its inception.

The Society gave the job of Editor of the *Extra Pharmacopoeia* to Mr C.E. Corfield, a pharmacist and analytical chemist admirably suited to deal with the two-volume *E.P.*[36] However, he had also to edit the *B.P.C.* and the *Pharmaceutical Pocket Book*. The Society generously appointed an assistant, Mr H. Treves Brown, and took on Mr Stephen L. Ward, Martindale's secretary to work under the guidance of the Codex Revision Committee. Since then there have been six editors: Dr Kenneth Roy Capper (2 editions), Robert G. Todd, Norman W. Blacow, Ainley Wade, Dr James E.F. Reynolds (4 editions)[4] and now Mrs Kathleen Parfitt.

What happened to the retail and manufacturing business? The Society could not have bought the pharmacy business and competed with its own members. It was said by Fitch that Mr E.T. Neathercoat, a former President of the Society and Treasurer from September 1934 to 1939, worked out a deal whereby Savory and Moore,[37] of which he was director, bought the Martindale business and sold the copyright of the book to the Society. The name continued on the retail premises in New Cavendish Street until the 1970s, the manufacturing side ended up in Martindale Samoore, then disappeared from view until the reincarnation of Martindale Pharmaceuticals in 1981.[38]

Dr Martindale had one son, William Harrison Montague Martindale (Marmaduke), born in 1908. He was not a pharmacist but inherited the property in Icklesham from his mother in 1934[39] and died there unmarried in 1976, so far as is known the last of the line.

There is a vast amount more to be discovered about the Martindales, and about the change of the book from Martindale and Westcott's *Extra Pharmacopoeia* to *Martindale: The Extra Pharmacopoeia*. The purchase of the content and copyright of its rival, *Squire's Companion to the British Pharmacopoeia,* in 1947 produced a change of coverage. Since pharmacists stopped using the *British Pharmacopoeia* regularly the word pharmacopoeia is considered to have less marketing power. The new 32nd edition, published by the Society in April 1999, is therefore titled *Martindale: The Complete Drug Reference,* so only *Martindale* remains as a potent reminder of a famous pharmaceutical family.

The considerable assistance of the staff of the Library and Museum of the Society, Dr James Reynolds and other editorial colleagues, and Dr Dilg-Frank for information from Marburg University archives is gratefully acknowledged.
This paper is based on a lecture to the British Society for the History of Pharmacy in April 1992[40]and subsequently augmented.

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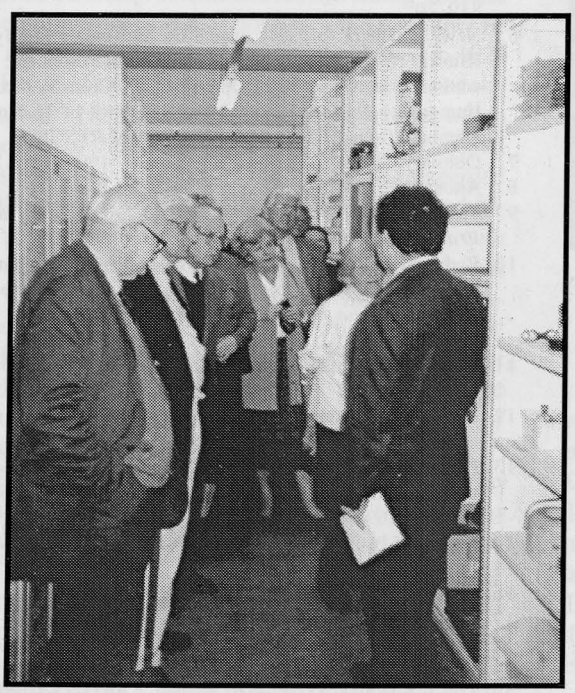
BSHP visiting Blythe House, the Science Museum store in February 1999



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Photographed in Cyprus by F.H.Rawlings

We do not believe that this is a Boots the Chemist accredited pharmacy!

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Contents.

British Oil.

Mr Francis Rawlings has kindly sent us several recipes for British Oil culled from two sources:

1. *New Supplement to the Pharmacopoeias*
by James Rennie, MA. 1833. p.57. **British Oil.**

Boil together one ounce (apoth.) of Camphor with four fluid ounces of rectified Spirit of Wine, twelve fluid ounces of Sweet Oil and five fluid ounces of Hartshorn.

2. *The Druggists' General Receipt Book*
by Henry Beasley. 1861. p.161. **Betton's British Oil.**

Mix together 8 ozs of oil of turpentine, 4 ozs of Barbados tar, 4 dr. of oil of rosemary.

p.162 **British Oils.**

Mix together oil of turpentine & linseed oil, of each 8 ozs; oil of amber and oil of juniper, of each 4 ozs; true Barbados tar 3 ozs, and American petroleum or seneca oil 1 oz.

Electrical Engineers.

From the *Institution of Electrical Engineers Review* of May 1999, p.137, under the heading 'First Lady.'

" 'Tonight we reach the close of the largest and fullest session in the history of the Institution...we have never before in any session had a series of communications so numerous, so varied and, as a whole, so important. The list of members includes the name of the first lady elected to the Institution.'

"With these words, spoken on 25 May 1899, retiring IEE President J.W.Swan marked Hertha Ayrton's election to full membership of the Institution."

Two months previously, Mrs Ayrton had presented a paper: "The Hissing of the Electric Arc" to the Institution, another first for her gender. This unusual occurrence attracted considerable attention from the press but it failed to mention that Joseph Wilson Swan born in 1828, had been a pharmacist in Sunderland and Newcastle-upon-Tyne for well over thirty years!

Excerpts from:

Our Village : Alison Uttley's Cromford

[Published by Scarthin Books, Cromford, 1984]

"Mr Stone the druggist was the village adviser, for at that time there was no doctor near.[Alison Uttley was born in December 1884 at Castle Top Farm near Cromford.] He pulled out the teeth of ploughboys, cured the coughs and earaches of children, and the backaches of old men, and advised on matters of health for man and beast. He had cattle cures, as well as all the ointments and medicines one could wish for, on his shelves. There we bought red drinks and purges, linseed oil and meal for poultices, packets of senna and bottles of embrocation. In his windows were great red and blue bottles, which shone at night like lamps. His bell tinkled dismally, and we waited a long timebefore he came forward, for he was always on his dignity, and would not be hurried for anyone. I was shy before this gaunt old man, unsmiling and dour, and I never went into the shop by myself. The grocer's wife popped a sweet in my mouth as I sat in the cart, and the newsagent gave me a marble, but the druggist kept his horehound drops to himself, or weighed them out with meticulous care, and sealed them with scarlet wax. I dealy wished to explore his shop, to see the witch-loke glass retort which stood on the shelf, to read the strange foreign words on the little white-knobbed drawers, but I was timid, and sat outside watching the great coloured jars with odd reflections of the market-place moving across them."

On another occasion she wrote that nearby was a boot shop and a draper's and that across from them , "...was the famous druggist's, with its three coloured glass bottles in the window and its fusty smell of embrocation, oil and soap, of scent and herbs. This was a waiting shop where I stood for hours waiting to be served. The druggist made up prescriptions and we wondered at his skill in reading the jagged scribble of vet or doctor on these documents."

(The pharmacy still exists in Cromford although the extraction of teeth is not now part of pharmaceutical skill.)

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The Continental Parallel: The Netherlands.

Dr A.I. Bierman.

[As the Continent consists of a number of countries all of which developed differently, Dr Bierman decided to confine herself to the country she knows best, namely The Netherlands or as we more usually call it Holland.]

Pharmaceutical education and training in the Netherlands

As you may remember the Dutch Pharmaceutical Society was founded in 1842, only one year after that in Britain. In the 1840s there were no statutory regulations for pharmaceutical education or training in either country. The then current law, the 1818 Medical Act, distinguished between two kinds of medical practitioners[1]. There was the physician, the 'doctor medicinae' who was a university graduate and was licensed to practice all branches of medicine. including internal medicine and pharmacy. On the other side were the so-called medical sub-professions of surgery, obstetrics, pharmacy, midwifery and that of the druggist. For these practitioners no university requirements were needed.

So in fact pharmacy was a medical sub-profession, but pharmacists were not qualified for any medical practice. We have here a substantial difference between our two countries, the Dutch pharmacist has never been allowed to practise any branch of medicine. This of course does not mean that he never did so! There is no doubt that pharmacists broke the law many times judging by the considerable number of complaints from physicians and surgeons, but legally pharmacists could only prepare and deliver medicines on prescription. Even when selling medicines 'over the counter' pharmacists were not allowed to give any additional medical advice.

For the medical sub-professions, the 1818 Act contained only standards for examination, but none relating to regulations for education and training. In 1823 the Government made an attempt to improve this situation. It was decided that 'Clinical Schools' should be established in all the main cities and that no apprentice in a medical sub-profession could be admitted for examination unless he had attended the lectures of such a school. In theory this should have should have made a significant contribution to pharmaceutical education, but in actual fact the new schools were set up for the education and training of rural medical practitioners. Pharmacy in the educational programme of these schools had only a minor position.

Moreover, the Government did not provide any money for this project, so 'Operation Clinical Schools' was only partly successful. Only in six towns was a Clinical School established, and they were all situated in the western part of the Netherlands. The problem of proper pharmaceutical education and training was by no means settled.

There was a real need for better education as at this period there were rapid changes in the field of pharmacy. The old master/apprentice model taken over from the guilds did not fit into these circumstances. However, the pharmaceutical profession itself decided to take action. In the 1820s, long before a pharmaceutical society was founded, established pharmacists managed to set up training courses especially for pharmacists-to-be, and they may be considered to be a kind of pharmacy school.

By the 1840s the Industrial Revolution had finally reached the Netherlands, and closely linked to it a liberal movement started, the new liberal ideaas being followed by economists and doctors. The latter who were engaged in medical politics were concerned about public health and especially about the care of the poor. The 1818 Medical Act had possessed no tools to force local government to take measures against poor sanitary conditions, so in the 1840s many voices were raised in favour of a new Medical Act.

Pharmaceutical voices came into the discussion too, but the pharmacists' arguments were quite different, public health and medical progress were not their main concern. What pharmacists wanted most of all was independence. They believed that pharmacy should become an independent profession, without any medical ties. So both doctor and pharmacist pressed for the abolition of the medical sub-professions, but using different arguments.

At last, in 1865 both Houses of Parliament accepted four 'Medical Laws', in which many hopes were realised. Medical sub-professions were abolished and pharmacy indeed became an independent profession. Furthermore, pharmaceutical education and training now had to take place at a university, consequently all existing training courses had to close. Not everybody was happy about this, and it is understandable. Much time and energy had been spent on these training courses, and in general they had been most satisfactory, so why should one go to a university? Opinions differed greatly on this point, but scientific pharmacy was on its way and could not be stopped; and to be 'scientific' meant a university was essential.

There was also another argument in favour of university training. Until now pharmacists had been practitioners in a medical sub-profession, but if with the new Medical Act, the education and training of all doctors had to take place at a university, then pharmacists wanted their education to be at university too, and not on a lower level.

In 1876 a new Higher Education Act introduced

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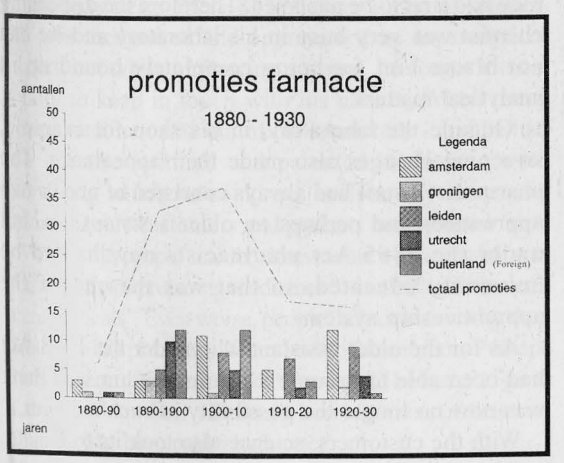
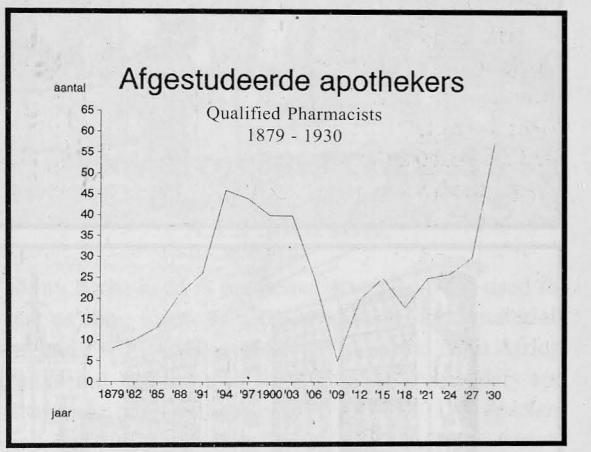
pharmacy and toxicology into the Faculty of Science at all four Dutch universities; **Note**: into the Faculty of Science, not the Medical Faculty. During the following years pharmaceutical laboratories were set up, and the newly established pharmacy courses certainly became comprehensive. Their purpose was to train, not only future dispensing chemists but also staff for the national inspection services such as those for the food and the water departments. As a result a closer look at the pharmacy courses show a big shift towards analytical matters, so that after a three year basic training in science, the main emphasis of the university course became analysis.

In this field of analysis the pharmacist became a real expert, but the number of vacancies in this area was soon filled to capacity, and almost all qualified pharmacists still found their work in work in dispensing. Qualification to practise could, as in the period before 1865, only be obtained by passing a state examination. Admission to this exam. was not possible unless a work placement, not unlike the former apprenticeship, had been undertaken.

So we can conclude that after 1876, pharmacy courses fitted well into the new ideas of scientific pharmacy. A question which may be asked is, "Did the universities add an extra value (possibly an unnecessary one) to scientific pharmacy?" This question may be answered if we use the number of doctorates or Ph.Ds as a measure. The figures show that pharmacists did rather well with 13% of the graduates gaining a Ph.D. It should also be kept in mind that a dispensing chemist had no monetary gain from a Ph.D. So it seems only fair to conclude that the university did indeed contribute to scientific pharmacy. It can be seen that in the first decades many Ph.D.s were obtained at a foreign university, the reason being that it was only possible to gain a Ph.D. at a Dutch university if you had attended a Latin school. In 1917 this condition was abolished, other types of preliminary schools being accepted.



The next graph shows the number of pharmaceutical graduates at the Dutch universities. During the first ten years there were increasing numbers, and in the next ten years a constant high level, but after that there was a considerable decerease up to 1926. These changes are understandable if we look at the job market. As already mentioned one purpose of the new pharmacy courses was to train staff for the national inspection services. In the first two decades it was easy to find a post in this work, but by 1905 this market was already filled, and the other one, that is working as a dispensing chemist was still over-crowded.



During the nineteenth century most towns still had numbers of pharmacies out of all proportion to their population. Admittedly the number had decreased after 1865 due to the tightening of regulations, the combination of a pharmacy with other trades for example being no longer possible.An idea of the extent of this reduction may be seen from the following figures: in 1864 the Netherlands had 940 pharmacies, but in 1884 there were 640.

The increase after 1930 is due to the economic depression at that period. As a qualified pharmacist, one could open a shop as the Netherlands has no business licensing conditions and pharmacy was then a popular occupation because it gave good prospects for work

The changes which occurred in pharmacy can be seen in illustrations. For example the drawing of Anton Pieck's is an impression of a pharmacy at the end of the eighteenth century. It was an attractive place, a bit mysterious and the pharmacist was there to talk to you whilst he prepared your medicine.

By the end of the nineteenth century the shop had fundamentally changed as may be seen from the design for an ideal pharmacy around the 1880s. These shops look very sober and there is nothing to be seen which does not belong to pharmacy.

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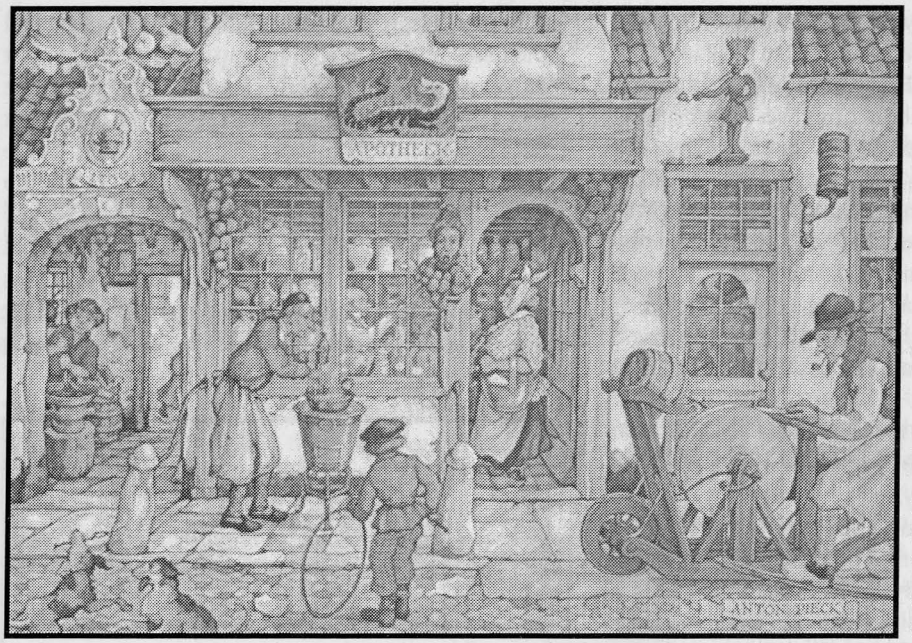

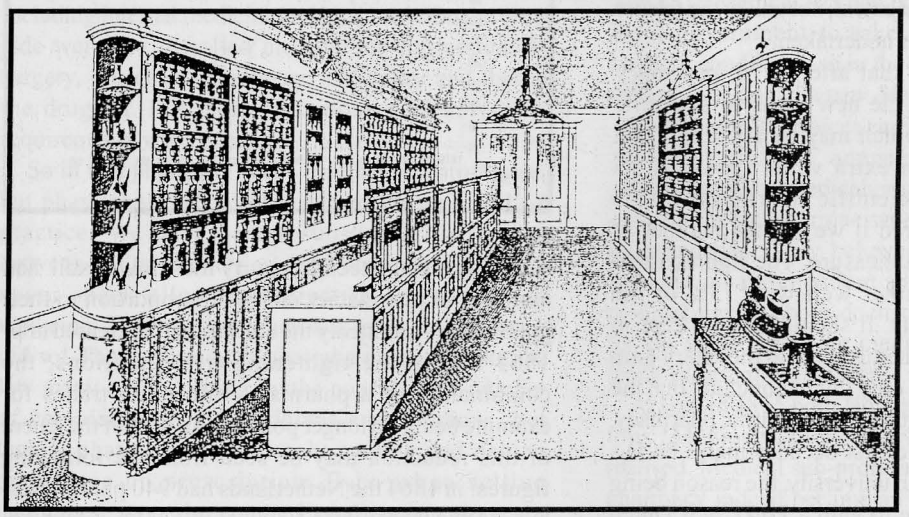

Although it was no longer permitted to make soap and medicines in the same room, the sale of shoe polish or washing blue could continue - and did. The term 'qualified grocer' haunted the Dutch pharmacy for a long time.

To speak more positively about the dispensing chemist we must pay attention to the laboratory which was the real home of the scientific pharmacist. There he carried out the complicated analyses of all the raw materials and ingredients used for preparing medicines; there he experimented with different ways of preparing medicines, and should he be successful, would publish the results in the pharmaceutical journal for discussion by his colleagues. In his laboratory he also carried out the analysis of milk and water, sometimes his analytical knowledge contributing to forensic medicine as well.

In the last decades of the nineteenth century, it became common to order preparations like extracts, tinctures, waters and syrups from a manufacturer, but before using these products they had first to be analysed. Therefore the dispensing chemist was very busy in his laboratory and we can not blame him for being completely bound up in analytical matters.

Outside the laboratory, in his shop for example, sweeping changes also made their appearance. The pharmacist's staff had always consisted of one or two apprentices and perhaps an older assistant too, but under the 1865 Act pharmacists now had to be university educated, so that was the end of the apprenticeship system.

As for the older assistant who under the 1818 Act had been able to become a pharmacist himself, there was now no longer the possibility of such a career.

With the customers, science also took its toll.

Contemporaries however tell quite a different story. In a letter to the editor of the *Pharmaceutisch Weekblad*, the Dutch pharmaceutical journal, in 1867 the writer wonders if pharmacy will ever be 'scientific' as long as chemists sell lamp oil, shoe polish, blue for the wash, pencils, pomade and starch as it would be impossible for people to regard him as a 'man of science', only as a 'qualified grocer'.

These non-pharmaceutical sales were condemned by the profession, but for the local pharmacist they were often the only way to survive. Before the 1865 Act it had been even worse, the Dutch towns being literally over-crowded with pharmacies.In their attempts to gain a sufficient income, pharmacists often started another business in the same building, such as that of a wine merchant, a soap factory or eau-de-Cologne factory, or one for paint. The 1865 Act required at least a separate room for these activities.

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The chemist's shop was no longer an easily accessible place where you could go for advice and buy drugs for self medication. Holloway's Pills, analgesics, Dr Livingstone's Kidney Balm and all other 'secret remedies' were banished from the chemists' shops. Nothing was known about these compounds, so it was impossible to analyse them. In pharmaceutical circles they were considered to be 'quack remedies', and an honest pharmacist would have nothing to do with them.

Consequently, when in the 1890s the first 'ethical' patented medicines arrived pharmacists refused to sell them saying these too were 'secret remedies'.

A third problem arrived in Dutch pharmacy with the entrance of women in the pharmaceutical world during the 1880s. Their arrival was watched with distrust as many male pharmacists thought a chemist's shop was no place for women. Nevertheless, women came, women went to university and women entered the pharmacy as assistants.

The female assistant was much cheaper than her male colleague because at the end of the nineteenth century it was the custom to pay people according to their needs, and not according to the work they did. Understandably, a young girl living with her parents had fewer needs than a married man.The male assistants left pharmacy where money was poor and moved to a more attractive job. They started a druggist's shop.

That was very easy, for under the 1865 Act anybody could start a druggist's shop. The title 'druggist' was not protected and there were no examinations as druggists no longer represented a medical profession.

Pharmacists who had perceived themselves more as scientists than as shopkeepers had in effect created their own rivals. At the druggists, people could go for advice and buy medicines for self-medication; pharmacies had become more and more just places where you could only get medicines on prescription.

In general we can conclude that the Dutch pharmacist in the sixty years after 1842 became a man of science. He was recognised and appreciated as an analytical expert, but while embracing science, he forgot almost totally to keep in touch with his clients. When many yearas later he came out of his laboratory - and he had too because 'ethical' and patented medicines were increasing which he could not analyse any more - he found that his customers and patients hardly knew him.

Worse still, people scarcely knew what a pharmacist was doing. Perhaps preparing medicines ? - but 90% of his stock were 'ethicals'. Even worse, people did not know why they should go to a pharmacy if they had no prescription. Perhaps for advice or self- medication ? You would be better to go to a druggist! In their efforts to become men of science, pharmacists have paid a high price.

However to finish this paper on a positive note, I must tell you that today the Dutch Pharmaceutical Society is working very hard at image-building and spares no pains to restore the relationship between the pharmacist and his patients. There are still problems in the Netherlands but they are different ones.

Today the slogan is: "Problems ? Ask your pharmacist! He can help you."

And I can assure you this slogan works!

Reference

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Curatives and Colours.

A.F.P.Morson.

Many herbs used in medicine have also been used for just as long to provide colours. Such plant materials together with spices were often imported from Africa, India and beyond and were handled by grocers and druggists both in Europe and Britain. The *épiciers* and *apothecaires* in mediaeval France sold a variety of items and minerals, althougfh in their very regulated way the French allowed only master painters to grind pigments until the late seventeenth century when ready-ground colours could be purchased from shop-keepers who became known by the middle of the eighteenth century as *marchands de couleurs.*

My first experience of spices was of saffron-coloured butter, popular in the Isle of Wight where it was given me by my grandmother. Saffron was said to lift the spirits, as Christopher Catlan wrote "It pierceth the heart, provoking laughter and merriment." and was probably why I enjoyed myself so much eating several slices of toast, saffron butter and marmalade.

With saffron we have colouring and flavouring together. Indigo, made from *Indigofera* a shrub of the pea family and still grown in gardens, is used medicinally in the treatment of ulcers and for cleansing wounds. Dioscorides, the greatest medical botanist, used indigo in his career with the Roman army. It continued to be used until the beginning of the nineteenth century when progress in chemistry caused many new substances to replace the old established ones.

One substance with a long history in this dual role of pigment and medicine was madder. It was first described in Chinese medicine in the Sheng Nang canon of herbs in about 150 BC, and was mentioned in the Ayarvedic medicine of India, a curious mixture of herbal medicine, yoga and simple psychology. Pliny

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used madder in the first century AD as a cure for jaundice, possibly because one of the pigments it contains is Xanthine which is yellow.

Madder is a herbaceous climbing plant,*Rubia tinctorum* to a botanist. Its roots were used to prepare to prepare an Ayervedic medicine which was believed to have Alterative effects, whilst Chinesse medicine used it as an anti-bacterial. As so often happened it was used as a universal cure, the list of complaints treated included, rheumatism, coughing, reduction of inflammation, stimulation of the circulation, the inhibiting of kidney and gall stones, as well as menstrual and menopausal complaints, herpes. and topically for burns and skin rashes. And after all those applications, the roots were used as a source of dye.Different mordants produced red, purple, orange and yellow dyes. The use of a metal salt as a mordant further altered the colour, iron producing a violet, and chromium a brownish red.

Not content with such a list of uses, the plants' leaves being prickly were used for polishing metal. Finally, what was left over was used as cattle fodder.

The rhizomes were harvested from three year old plants and dried before storage. The process for making the dye from them, known as Turkey Red, was complicated. The Dutch, Turkish and French were the leaders in a large industry. The pigment was identifies in the nineteenth century and named Alizarin or madder red.

I have talked about madder not only because of its ancient history and wide use in medicine but also as an example of an industry destroyed by chemistry in 1868. Two German chemists, Graebe and Lieberman, worked out a practical synthesis of Alizarin and within a few years madder was only of minor importance.

These two chemists were following in the footsteps of a young man, aged seventeen in 1855, who whilst searching for a synthesis for quinine under the supervision of Hoffman discovered Aniline Mauve for which he took out a patent in 1856. I am of course referring to William Perkin.

The range of aniline dyes became enormous, were applied to paints and cloth, and also to medicine. the aniline dye industry grew quickly, fine chemical manufacturers responding by maketing a wide range in purer forms. The stimulus to trade was welcome at a time when the industry was in a period of decline. Several fine chemical firms manufactured the new substances but one must not assume that all firms selling these aniline dyes were actually making them. By 1867 Thomas Morson's were making about fifty, several in more than one grade of purity., an indication that different grades were put to different uses; medicine, confectionary, photography and microscopy all had uses for aniline dyes.

Thomas Tyrer listed 35 colours which were probably made in their Stratford works; the same applies to May & Baker and to Whiffens, two companies with strong manufacturing histories. I would be doubtful about John Bell, less so about Howards. Charles Page was a well known trader in all fine chemicals but I have been unable to find evidence of manufacture. Those firms which diversified were the ones whose skills and interests were in chemical manufacture in preference to pharmaceutical production. One firm, Manders, started by two brothers, one in paints and inks, the other in pharmacy, merged in the nineteenth century. Paint production took their firm to a leading position in that trade. They are now ink producers who have sometimes been linked to chemical and pharmaceutical companies.

Gallenkamp listed over 150 colours, some designated as specially prepared as photographic sensitising colours, probably a reference to colouring prints. This firm, however, were laboratory suppliers and were primarily interested in advertising their list as evidence of the comprehensive range they sold. Their customers were the laboratories of industry, hospitals, schools and research establishments.

In 1869 a successful attempt was made to stain bacteria with an aniline dye. Hoffman used fuchsine. Erhlich believed that a dye which stained a germ also sterilised it, and introduced methylene blue as a remedy for malaria. It was at John Hopkins University in 1912 that the selective action of gentian violet on bacteria was discovered, the dye inhibiting their growth, and for many years it was used as a topical anti-infective.

Dyes have also been used to test kidney and liver function, whilst bromsulphaleine was injected into a vein for a similar check. Likewise a dye was used to measure how long it took after injection for it to appear in the urine. Fluorescein was used as an antiseptic, and acriflavin in the treatment of gonorrhoea.

It must not be overlooked that long before aniline dyes were discovered, inorganic chemicals came to be used as pigments, mainly as a result of the discoveries by French and English chemists. By the middle of the eighteenth century, zinc oxide and Prussian blue were being manufactured and these developments gathered pace at the start of the the next century.

Cobalt blue and chromium salts, a wider range of lead salts and those of tin were made in considerable quantities. Vauquelin discovered chromium in 1797, and yellow, orange and green compounds followed from his work by 1809. He realised soon after his discovery that its salts would provide new pigments. He is commemorated by a fine bust erected on a stone plinth at a small junction near Pont l'Eveque on the R.N.175 in Basse Normandie.

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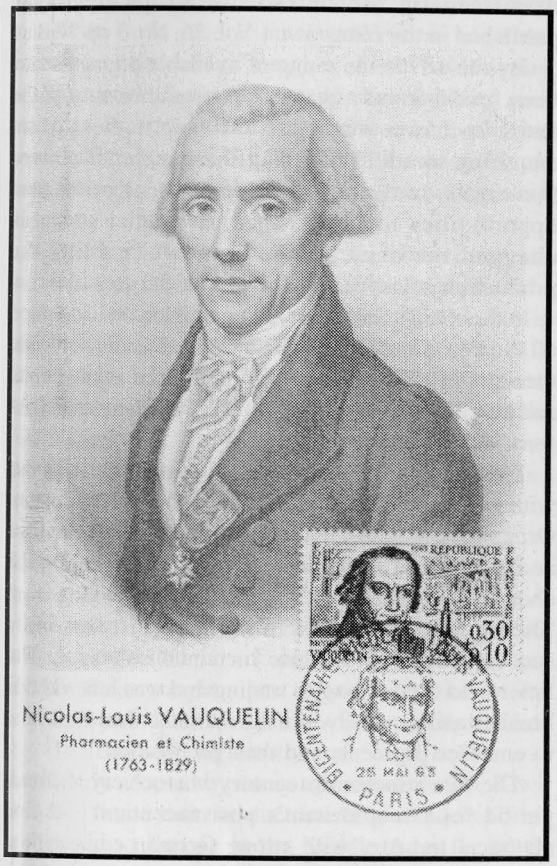
Courtois not only discovered iodine, he was also the laboratory demonstrator at the Dijon Academy, then a centre for investigating colours. Fourcroy, Berthollet and Vauquelin were involved in judgements concerning the application and use of these inorganic colours, one of which, zinc oxide, was immune to blackening in the sulphur laden atmosphe of those times but had poor covering power.



Postcard produced to commemorate the bicentenary of the birth of Nicolas Vauquelin.

All these men, especially Vauquelin, made contributions to analytical techniques; but one of these was perhaps unexpected - at least to one group of painters!

Humphry Davy was one of the first scientists to use his knowledge to analyse paints in order to discover the source of the colours. He identified vermilion (mercuric sulphide), red lead, yellow lead oxide and green pigments based on copper salts. Later this knowledge was used to identify painting forgeries. The modern origin of a 'Frans Hals' painting of the Laughing Cavalier was revealed when cobalt blue and zinc white were detected - neither of these substances being available in the seventeenth century when Hals was alive.

With the micro-analytical techniques available today paint samples as small as a needlepoint may be analysed. The career of the famous master forger, Van Meegeren, was successful because his great knowledge of pigments enabled him to avoid those not available in earlier times. However, he did not take sufficient care over one source of supply, using cobalt blue on a work which led to its identification as a fake.

The knowledge gained by so many chemists was quickly exploited by them, for instance Courtois had shops in Dijon and later in Paris through which he sold his zinc white and other colours. Chemical firms and wholesalers also took advantage of these new opportunities. More and more inorganic substances were introduced to help painters, chromium, barium, cobalt, zinc, nickel and cadmium salts were added to the range of iron, copper, aluminium and other older established substances.

Pigments were studied for colour, texture and particularly permanence. Following the publication of George Field's work of 1835 on chromatography a more rigorous testing of pigments took place.

Like much that was done in processing drugs, the wholly empirical and sometimes secretive practices of painters and their suppliers involved the use of materials which we find inexplicable. Developments in chemistry were useful to inject some science into the craft, just as it was doing to that of the druggists. By 1891 the French were publishing papers asking such fundamental questions as, "Will we see the masterpieces of the future preserve their brilliance and freshness?" To this end painters experimented over many years, for example paint was taken from a tube which was re-sealed and not used for six months, it was then re-examined for colour and texture.

The new metal compounds provided many pigments for painters in oil, watercolours and ceramics, each application needing a different formulation. Perkins' work introduced many new pigments of entirely different hues which were used in 'lake-making', a technique for making colours more solid by combining a strongly coloured dyestuff with a translucent inorganic base. The new colours lent themselves to these sorts of combinations. Paint technology was also used to overcome the tendency to fading. Fillers such as silica, china clay and barium sulphate were used to improve both this and handling qualities. A better understanding of drying led to the elimination of some additives, the reasons for whose use had been lost.

Newly invented pigments appeared more frequently between 1800 and 1860 than at any other time in the history of easel painting. This continued into the Age of Impressionism which started in about 1870 and was

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the result of dissatisfaction with existing methods. Painters of all schools had a new range of colours, and the quality of mixing, grinding and formulation was also improved.

Analysis and microscopical inspection of paints have likewise played their part in studying the Impressionists' painting techniques. The knowledge gained has been used for the conservation of paintings of all periods. The chemistry of paint production had served to give artists the new stunning and vibrant colours associated with Impressionism, the range was now as wide as the spectrum.The change occurred just when the Impressionists were feeling the constraints of French academic practice, rejecting the gloomy materials previously used.

New attitudes to colour and their study of the effects of light caused them to try painting out-of-doors. The small but essential improvement of substituting after 1840 collapsible tubes for pigs' bladders enabled artists to move out into the open air. The well preserved condition of most Impressionist paintings is a tribute to the standards demanded by the artists and to the chemists who provided their materials.

It was not only painters who enjoyed these new colours and methods. The late eighteenth century and all the nineteenth saw developments in ceramics which increased the demand for colours. That industry used inorganic salts for their creations, whether of everyday crockery or of the highly artistic and decorative pieces of Meissen, Sèvres, Minton and others. I recall being sent in about 1950 to the firm of William Blythe in Lancashire and was intrigued by the range of substances, some made by us at Ponders End, which they sold in small quantities to the china works of Staffordshire and elsewhere. I learned how in some cases the colour painted onto the clay was entirely different from the wonderful lûstrous colour which appeared after firing.

We should not overlook that this extension of choice was available to the far more numerous amateur painters. The demand they generated increased the market still further for products of relatively high value, a factor which has always to be taken into account by fine chemical makers. They seized an opportunity to supply two sets of customers. The purity required for medicines was not always so much higher than that for pigments; thus, the main strength of manufacturers, their skill in chemical manipulation, was exploited.

A good indication of the parallel development of chemicals for these two applications is provided by the catalogue of the 1851 Exhibition. The French and Italians, as well as the British, included natural and inorganic colours in their exhibits, five firms having stands side by side with Windsor and Newton. Many of them are also to be found on the pharmaceutical list, but Huskinsson and a few other firms that were chemical makers only, were there too.

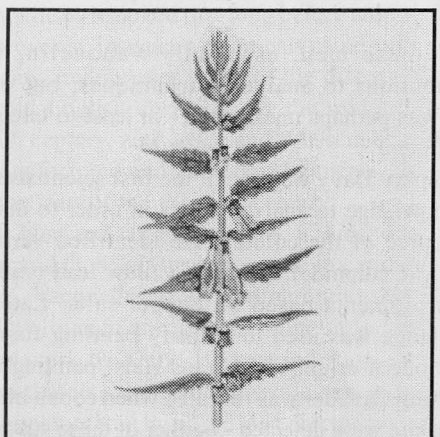
A result of the newer substances becoming available in bulk was that the use of toxic substances declined. Arsenic was one and mercury another; aspects of poisoning by arsenical pigments were discussed by Mr Jackson in an earlier paper published in the *Historian.* (Vol. 26. No. 3 pp 27-31)

By the 1870s the range of available pigments had been fundamentally changed, powerful colours of the entire spectrum were now available to those of an enquiring mind. Throughout the nineteenth century there was continuous progress, so creating new opportunities for artists, just as parallel advances changed medicine to the point of enabling the production of aspirin by the end of the century.

In their 1878 Sales List, Thomas Morson's included all the new pharmaceutical substances and in addition the salts of eighteen metals, not all used in medicine, and also 33 aniline dyes which were available in crystal form or in solution.

There was a rough similarity between the progress with colour making and that of medicinal chemistry. Originally a single individual was the maker, but science and production technology in the end resulted in the chemical manufacturer's specialist skills taking over. The entrepreneurial chemist/pharmacist was more successful than his colour merchant colleague. The latter held on too long to trading and was left with his brushes and canvas, while the manufacturer expanded to embrace pigments and their preparation.

The late nineteenth century was a very difficult period for Great Britain's pharmaceutical and fine chemical industry with strong German competition, but the developments described expanded the industry's horizons and helped it to survive.



Greater Skull-cap
Scutellaria galericulata

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The Ancient Doctrine of Signatures or Similitudes

William E. Court

Good health has been the ambition of man since the dawn of civilisation as it was essential for survival in a harsh world long before the discovery of rational medicine. The earliest ideas of healing treatments were passed on from generation to generation and from tribe to tribe by word of mouth with inevitable errors, omissions, additions and exaggerations. Many such ideas, good and bad, became accepted and achieved remarkable respectability in both folk lore and early medical writings, with inappropriate woodcuts and diagrams.

With observations of healing methods came the theoretical explanations of nature's healing gifts. The academic outpourings of the scholarly giants such as Hippocrates (c. 460-377 BC), Aristotle (384-322 BC), Dioscorides (50-100 AD), Galen (130-201) and Avicenna (c. 980-1036) played a vital role in the formulation of our modern, western ideas of medicine but their theories tended to be dogmatic and frequently lacked a sound scientific basis. Science was in its infancy and treatments could often be dangerous (Trease, 1964). Life was truly survival of the fittest or the luckiest!

The tribal specialist to whom ordinary people turned was neither a scholar nor a literate person and he or she sought signs from observation of the world around the tribal centre. From earliest times the Doctrine of Signatures or Similitudes was unwittingly adopted by many tribes worldwide. Kreig (1965) claimed that the doctrine originated in China and spread to Europe in the Middle Ages (c. 1000-1400 AD). However both Pliny (Gaiûs Plinius Secundus; 23-79) in his *Historia Naturalis* (37 volumes) and Pedanios Dioscorides of Cilicia in Asia Minor (50-100) in his *De Universa Medicina* indicated a shape relationship between specific body organs and specific healing plants. Certainly it was firmly enunciated by Philippus Aureolus Theophrastus Bombastus von Hohenheim (1493-1541), a Swiss alchemist and physician who was born at Einsiedeln and, according to legend, achieved a certain notoriety by publicly burning the writings of Galen and Avicenna in Basel where he was a university lecturer from 1527 until dismissed in 1538 for his outrageous behaviour. He opposed Galen's dogmatic hypothesis and the Arabian scholars' use of polypharmaceutical mixtures, much preferring 'simples', preparations derived from one plant only; better known as Paracelsus he died in Salzburg in 1541. To his lasting credit he believed in research rather than dogma and in the search for the 'signum naturae' and 'essentia quinta' or quintessence of each plant. This stimulated the study of the chemistry and the chemical constituents of plants and laid the foundations of phytochemistry. Fortunately for Paracelsus, publication and therefore access to books and consequent propagation of his ideas developed rapidly both in his lifetime and subsequently following the invention and exploitation of the printing press by Johannes Gutenburg (c. 1400-1468) in Strasbourg, France and later in his home city of Mainz, West Germany.

The enunciation of the doctrine became well-known throughout Europe. Indeed the Neapolitan scholar Giambattista Porta in his herbal book *Phytognomica* (1588) employed a kind of Doctrine of Signatures; unfortunately he was a better student of physics and mathematics than of biology and readily assimilated the Aristotleian ideas that heavenly body movements provided motivating forces for human beings. Hence valid observations and strict logic were confused with the practices of the soothsayers and magicians (Anderson, 1977). The Doctrine of Signatures was obviously much older than these 16th century practitioners, probably in use in China and India over 2000 years earlier, and arose independently in Africa and the Americas. Because Paracelsus gave it a certain respectability, it has permeated herbal medicine worldwide. The Doctrine states simply '*Like cures like and each medicinal product from nature indicates by an obvious and well-marked character the disease for which it is a remedy or the objective for which it can be employed*'. This implies that for every ailment there is a specific plant remedy defined by the shape, colour or other physical feature, e.g. habitat, distribution, of the botanical entity, and God, it was believed, had left a clue for the "expert" to find.

The Doctrine in Britain

In Britain Nicholas Culpeper (1653), despite his application of astrology, apparently supported the Doctrine of Signatures. In his monograph on the red flowers of *Amaranthus* he states '*And by the icon, or image of every herb, the ancients at first found out their virtues. Modern writers laugh at them for it; but I wonder in my heart, how the virtues of herbs came at first to be known, if not by their signatures; the moderns have them from the writings of the ancients; the ancients had no writings to have them from.*' Nevertheless the much maligned John Gerard (1636) warned against the indiscriminate use of red flowers to assuage bleeding, citing Galen as stating '*There can be no certainty gathered from the colours, touching the vertues of simple and compound medicines; wherefore they are ill persuaded that thinke the floure Gentle to stunch bleeding because*

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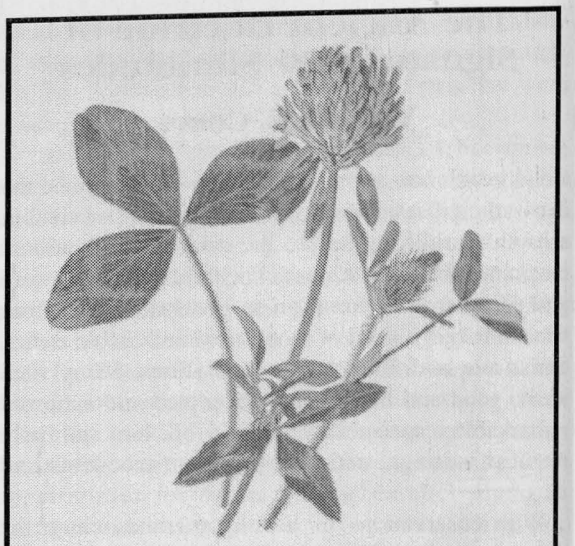
of the colour only, if they had no reason to induce them thereto'. Some of Culpeper's contemporaries also challenged his ideas although others, such as William Coles, herbalist and author of *The Art of Simpling* (1656), still clung tenaciously to the concepts of the Doctrine of Signatures or Similitudes, stating '*The mercy of God which is over all his workes....(he) hath not onely stemped upon them (as upon every man) a distinct forme, but also given them particular signatures, whereby a man may read even in legible characters the use of them....'*

The Doctrine apparently held sway from the 11th to 18th centuries in a period when man's anticipated life span was comparatively short, literacy was relatively rare, and cause and effect were less readily perceived. The Doctrine even appears in current literature from time to time and Lyman-Dixon (1998) refers to 15 recent herbal books which fail adequately to condemn the hypothesis.

What is the evidence supporting the Doctrine? Was it a meaningful theory or just visual allegory? Colour was an obvious sign and many examples are known. In Britain Amaranth (*Amaranthus hypochondriacus* L., fam. Amaranthaceae) is a good example. A common garden plant known colloquially as Red Cockscomb or Love-lies-bleeding, it possesses rounded tufts of tiny flowers hidden in tapering red bracts from August until the early frosts. Culpeper (1653) recommended the red flowers for all kinds of bleeding although Gerard (1636) had warned against such use of Purple Floure-Gentle. The reported use for the staunching of bleeding has some support as the plant yields astringent tannins as well as the red pigment amaranth once used as a colouring matter in medicines and foods.

The red juice of Blood Root (*Sanguinaria canadensis* L., fam. Papaveraceae) for anaemia was cited by Kreig (1965). Preparations of this plant, an indigenous species in Canada and northern USA, were used as tonics, expectorants and antimicrobials and as stains for fabrics and bodies, hence the common name Red Indian Paint. Recent observations confirm the presence of isoquinoline alkaloids, and bloodroot ointments have been used for the treatment of skin infections and epithelial tumours (Wren, 1988). However the plant is of questionable value in the treatment of anaemia.

Red Clover (*Trifolium pratense* L. fam. Leguminosae), another common indigenous species, was once recommended for blood disorders. The flower heads are globular or ovoid and reddish-purple in colour although some varieties are almost white. In European folklore the plant was used as a diuretic and expectorant and was considered as a stimulant of the liver and gall bladder. The coumarins present in clover would have acted as anticoagulants,



Red Clover. *Trifolium pratense*

dissolving blood clots although overdosing was an obvious danger (Kreig, 1965). Modern herbalists use the plant orally and externally for dermatological conditions such as eczema and psoriasis.

The red glow of Rose hips from *Rosa canina* L., *Rosa gallica* L. and some other *Rosa* species was an example of sympathetic magic, the glow indicating a good tonic. The oval, scarlet, fleshy fruits or hips yield vitamins, especially vitamins A, B_1, B_2, niacin, K, P and C (up to 1.25 per cent); also present are invert sugar (c. 10-14 per cent), the flavonoid rutin, tannins and polyphenols. Gerard refers to the Dog-rose as the Brier Bush or Hep Tree and mentions '*even the children with great delight eat the berries thereof when they be ripe, make chaines and other pretty gewgawes of the fruit: cookes and gentlewomen make Tarts and such-like dishes for pleasure thereof*'. Of wild roses he says '*We have them all except the Brier Bush in our London Gardens, which we think unworthy the place.*' In our own time the hips of *Rosa canina* have been used as an astringent, a mild diuretic and laxative and a source of vitamin C, factors indicating value as a tonic.

Jaundice

Greenish (1933) referred to yellow juices for jaundice as did Kreig (1965) for yellow flowers. The herb Greater Celandine *(Chelidonium majus* L., fam. Papaveraceae) yields a yellow latex containing the alkaloid chelidonine which has a powerful effect upon the smooth muscle of the bile duct, removing bile from the liver and thus relieving jaundice. Another plant, Barberry (*Berberis vulgaris* L., fam. Berberidaceae), is common in European gardens. The yellow flowers, yellowish-grey stem bark and yellow wood clearly suggested a treatment for jaundice and the flowers

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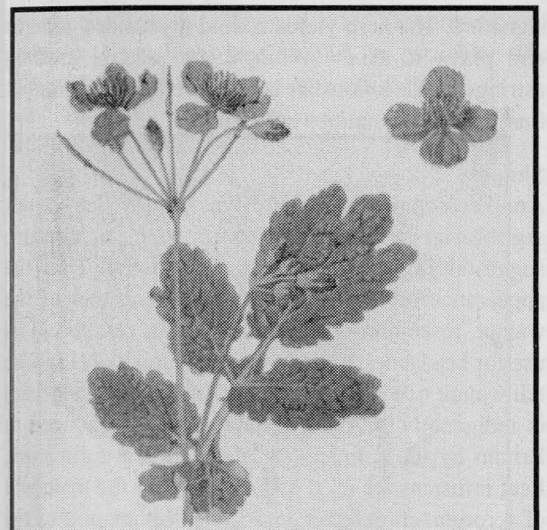
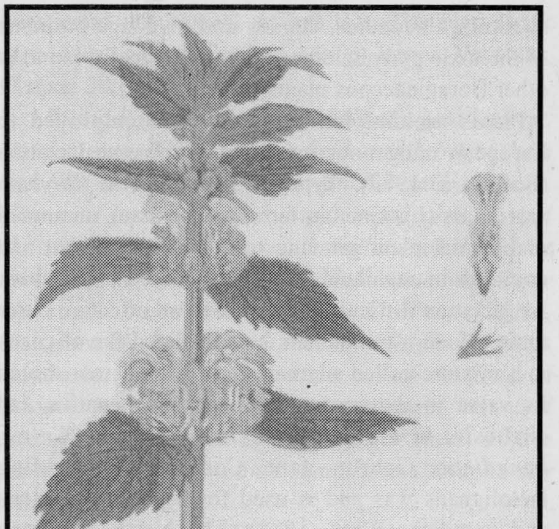


Greater Celandine. *Chelidonium majus*



White Deadnettle. *Lamium maculatum*

were so used in the Middle Ages. The ancient Egyptians had employed the plant as a fever cure and Culpeper extolled the shrub: *'Mars owns the shrub and presents it to the use of my countrymen to purge their bodies of choler. The inner rind of the Barberry Tree boiled in white wine, and a quarter of a pint drank each morning, is an excellent remedy to cleanse the body'* Lust (1978) recorded that the plant, also known as the jaundice berry in North America, yielded an alkaloid that promoted the secretion of bile and was therefore useful for liver complaints. Earlier Wren (1956) had referred to its employment as a tonic, purgative and antiseptic applicable in all cases of jaundice, liver complaints, general debility and biliousness. Modern research has revealed berberine-type isoquinoline alkaloids, resin and tannins, and bactericidal, amoebicidal, trypanocidal and bile secreting actions have been confirmed (Wren, 1988).

Saffron, comprising the autumn gathered groups of three thread-like, deep orange-red stigmas of *Crocus sativus* (fam. Iridaceae), was used at one time for hepatic conditions including jaundice (Pratt and Youngken, 1956), although also used for many other complaints. It was once grown in the area between Cambridge and Saffron Walden and its use may have been more related to its high cost than to its dubious medicinal effectiveness. Today it is used in food as colouring and flavouring, the colour being due to the bitter glycosides named crocins and the warm spicy odour to safranal, a decomposition product of the crocins (Wren, 1988).

The white flowers of White Deadnettle, also known as Archangel (*Lamium maculatum* L, fam. Labiatae) were used to treat the white discharge of thrush. The white flowers resemble the white vesicles caused by the yeast *Candida albicans*, developed in the mouth, throat or vagina. Yielding tannins, amines, saponins, flavonoids and mucilage, there is evidence of effective astringent and haemostatic action on the uterus and mild diuretic and antiseptic properties (Wren, 1988).

The herb and red-brown roots of Tormentil (*Potentilla erecta* (L.) Raeuschel, fam. Rosaceae). were suggested for haemorrhage (Greenish, 1933). A small and insignificant plant characterised by only four bright yellow petals and sepals, common tormentil occurs widespread in Europe on moors. in woods and in grassy places. A fluid extract can be used as a styptic for cuts and wounds, sores and ulcers. This plant is an effective astringent tonic as it yields tannins (catechins and ellagitannins) and a phlobaphene also known as tormentil red (Weiss, 1988; Wren, 1988).

The Lungwort (*Pulmonaria officinalis* L., fam. Boraginaceae) was valued for the treatment of pulmonary affections because its spotted leaves resembled spotted (i.e. congested) lungs (Greenish, 1933). A perennial herbaceous plant with downy,spotted or blotched, lanceolate leaves and reddish-purple flowers, lungwort occurs in shady places such as deciduous woods throughout Europe. By coincidence the leaves are mucilaginous and bitter and therefore rightly praised by the herbalists as an astringent, pectoral and mucilaginous healer, useful in the treatment of coughs, lung complaints, asthma, etc., and to allay inflammation. Infusions were usually used and lungwort is an ingredient of Potter's Balm of Gilead Cough Mixture. Our modern explanation is the soothing effect of the mucilage coupled with the expectorant action of saponins. Current studies reveal

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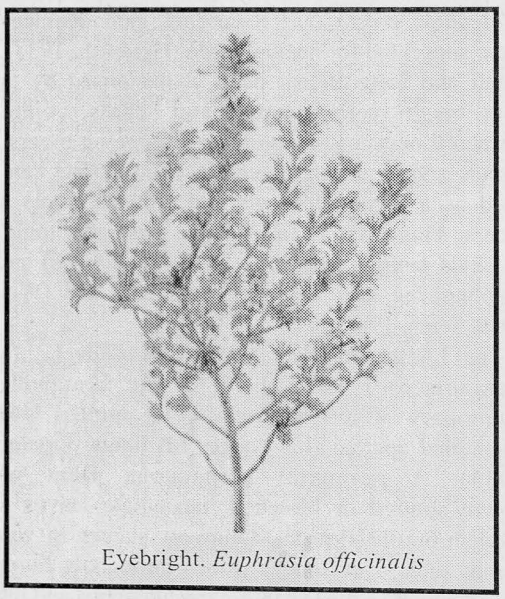
allantoin, flavonoids, tannins and mucilage but none of the toxic pyrrolizidine alkaloids normally found in other Boraginaceous plants (Wren, 1988).

Plants yielding milky juice were employed in European indigenous medicine to increase lactation (Sofowara, 1982). Typically milk thistle (*Silybum marianum* (L.) Gaertn., fam. Compositae), an annual or biennial plant growing to a metre in height and common in mainland Europe was used as Silybum for lactation difficulties and it was an effective bitter tonic. Modern researchers have isolated flavolignans in a mixture called silymarin and have demonstrated its value in the treatment of chronic hepatitis and cirrhosis. In Germany the Holy Thistle (*Cnicus benedictus* Gaertn., fam. Compositae) yielding lactolignans was and is used for hepatic conditions and jaundice (Wren, 1988). The North American Indians also used plants such as the Green Milkweed (*Asclepias viridiflora* Raf., fam. Asclepidaceae) and Snow-on-the- mountain (*Euphorbia marginata* Pursh., fam. Euphorbiaceae), with milky sap indicating value for nursing mothers needing more breast milk. As green milkweed yields cardioactive glycosides and the euphorbias toxic diterpenes, the teas, which have some aperient activity, needed to be very weak!



Eyebright. *Euphrasia officinalis*

Eyebright (*Euphrasia officinalis* L., fam. Scrophulariaceae) was and is much esteemed. Gerard (1636) informed us '*It is very much commended for the eies. Being taken it selfe alone, or any way else, it preserves the sight, and being feeble & lost it restores the same.*' In Africa eyebright is used for dim sight (Sofowara, 1982) and elsewhere also for conjunctivitis as an eye lotion. The white corolla has a purple spot resembling an eye and is therefore the signature. The herb yields iridoid glycosides, tannins and phenolic acids (Wren, 1988) and is used in astringent eye lotions. It is still used by 'hakims' in immigrant communities in Britain.

Shapes

Another common signature was shape: the earnest signaturist would find some form or feature suggesting a part of the human anatomy. Thus the appearance of the seed shell and the kernel of the walnut, resembling tiny human brains, resulted in its use for headaches and epilepsy (Greenish, 1933). The tall walnut tree (*Juglans regia* L., fam. Juglandaceae) is indigenous to Asia Minor but was introduced to Britain by the Romans early in the first millenium. Leaf infusions are used by herbalists for the treatment of scrofula, chronic eczema and inflammation of the eyelids (Weiss, 1985). Current research reveals that naphthaquinones (especially juglone), volatile oil and tannins occur in the plant. Juglone is an allelochemical, that is, it stunts the growth of other cells and, in particular, can inhibit tumorous growths. French workers have demonstrated that juglone can arrest certain skin cancers, thus confirming early folklore and Culpeper's use of walnut infusions and decoctions externally on skin eruptions and ulcers. Significantly Culpeper gave the instruction '*Let the fruit of it be gathered accordingly, which you will find to be of most virtues whilst they are green, before they have shells*'; this certainly did not suggest a doctrine compliance. The value of walnut in the treatment of headaches and epilepsy has apparently not been confirmed.

Scullcap or Quaker Bonnet (*Scutellaria lateriflora* L., fam. Labiatae) and Greater Scullcap (*S. galericulata* L.) are common herbs in America and Europe respectively. The blue or pink paired flowers resemble the outline of skulls. Therefore it was used for the treatment of nervous conditions such as hysteria where the sedative, anticonvulsant and antispasmodic properties are of value. Yielding flavones and flavonoid glycosides (particularly scutellarin), iridoids, tannins and volatile oil, this plant is widely and effectively employed..

The use of liver-shaped parts of plants for bilious diseases and in particular the liverworts (literally liver herbs) has been reported (Pratt & Youngken, 1956, Sofowara, 1982). Both the liver-shaped thalli of English Liverwort (*Peltigera canina* (L.) Will., fam. Peltigeraceae) and the herb American Liverwort (*Hepatica nobilis* Mill., fam. Ranunculaceae) were used for hepatic complaints. English Liverwort has a mildly purgative action.

The trembling leaves of Quaking American Aspen (*Populus tremuloides* Michx., fam. Salicaceae) were employed for palsy, the condition characterised by

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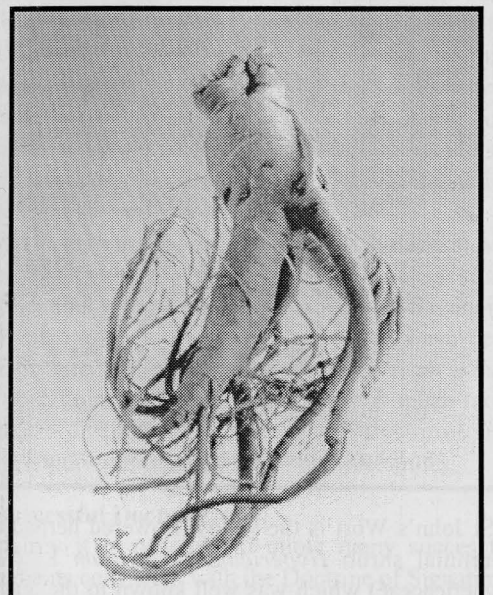
involuntary tremors (Kreig, 1965). The presence of phenolic glycosides, tannins and, in particular, the glucoside salicin suggests some efficacy.



Panax Ginseng by courtesy of Pharmaton, Lugano

Ginseng, a plant yielding root systems resembling the human form, is a popular tonic today and in Chinese herbal medicine has been regarded as a panacea, a cure-all for impotence and a useful aphrodisiac. Chinese and Korean Ginseng (*Panax ginseng* C.A. Meyer, fam. Araliaceae) bear the specific names 'ginseng' or 'schinsen' meaning man-like and in oriental commerce the more anthropomorphic the root system specimen the higher the market price, older roots being particularly valuable. Today it is known that ginseng yields pharmacologically active compounds such as saponin glycosides called ginsenosides, polyacetylenes, polysaccharides and oils. It is a very safe plant whose tonic effect has been confirmed and also its value as an anti-stress, anti-ageing and anti-tumour agent. Explanation of the apparent aphrodisiac effect can only be related to a normalizing action yielding a feeling of well-being that encourages normal sexual activity.

Mandrake

The best known of the man-like plants is Mandrake (*Mandragora officinalis* L.,fam. Solanaceae), a dangerous plant. Despite the man-like appearance and folkloric reputation as an aphrodisiac, this plant contains toxic tropane alkaloids with a sedative action far outweighing any aphrodisiac effect. Significantly, mandrake was debunked by Gerard (1633) who also questioned the biblical reference in The First Book of Moses, called Genesis (King James Version), Chapter 30:

'14. *And Reuben went in the days of wheat harvest, and found mandrakes in the field, and brought them unto his mother Leah. Then Rachel said to Leah, Give me I pray thee, of thy son's mandrakes.* [15]. *And she said unto her, Is it small matter that thou hast taken my husband? and wouldest thou take away my son's mandrakes also? And Rachel said, Therefore he shall lie with thee to night for thy son's mandrakes.*[16]. *And Jacob came out of the field in the evening, and Leah went out to meet him, and said, Thou must come in unto me; for surely I have hired thee with my son's mandrakes. And he lay with her that night.'*

Gerard notes that '*Great and strange effects are supposed to bee in Mandrakes, to cause women to be fruitfull and beare children, if they shall but carry the same neere to their bodies*', and then proceeds to question the identityof the plant used. He was probably correct. In a modern work (1982) botanist Professor Michael Zohary of the Hebrew University, Jerusalem also questions its identity. Jacob, Leah and Rachel were living in Mesopotamia where *Mandragora autumnalis* L. does not grow. Why the mistake? It is suggested that the Greeks, who were familiar with *Mandragora* species in their own country, perpetrated the error, translating Aramaic and Mishnaic renditions of the Hebrew 'dudaim' as mandrakes . As Zohary pointed out, the Song of Solomon (Chapter 7) states:

'13. *The mandrakes give a smell, and at our gates are all manner of pleasant fruits, new and old, which I have laid up for thee, O my beloved*'

and the Pseudepigrapha, the Testaments of Issachar (Chapter 1, v. 3-5) indicates:

'*My brother Reuben brought mandrakes from the field ..... and there were apples sweet scented growing above the water beds in the land of Aram.*"

Mandrakes grow in the fields, not on the riverbanks and cannot be the drug we recognise. Mandrakes were used in the Graeco-Roman death wine 'Morion' given before tortures and crucifixions, and in medieval witches' brews for their narcotic effect, being often used as ointments or unctions that permitted absorption of the tropane alkaloids through the skin, thus inducing sleep without the toxic danger of oral administration. Folklore concerning the harvesting of mandrake abounded and Gerard recorded the scurrilous fable, '*he who woulde take up a plant thereof must tie a dogge thereunto to pull it up, which will give a great shrike [shriek] at the digging up; otherwise if a man shall*

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do it, he should certainly die in a short space after', and the unfortunate dog appeared in many exotic mediaeval diagrams.

As we are in Stratford-on-Avon, one must mention a confused William Shakespeare (1564-1616). In Romeo and Juliet (Act IV, Scene III) Juliet observes '*And shrieks like mandrakes torn out of the earth, that living mortals, hearing them, run mad.'* Falstaff, in King Henry IV (Part II)(Act III, Scene II) utters the pharmacological confidence '*yet lecherous as a monkey, and the whores called him mandrake.*' But Cleopatra, (Antony and Cleopatra, Act I, Scene V), requests *'Give me to drink mandragora.... That I might sleep out this great gap of time.'* Shakespeare knew the old folklore but not the pharmacology!

Snake Roots

Snake roots such as Indian Snakeroot (*Rauvolfia serpentina* Benth.fam. Apocynaceae), American Serpentary (*Aristolochia reticulata* Nutt. fam. Aristolochiaceae), Button or Corn Snakeroot (*Eryngium aquaticum,* fam. Umbelliferae), and Seneca Rattlesnake Root (*Polygala senega* L., fam. Polygalaceae) are all characterised by a vague resemblance of their roots to serpents. Gerard refers to *Pistolochia cretica siue virginiana* or Virginian Long Birthwort, a plant with long thick roots of the colour of box, of a strong savour and bitter taste; Dioscorides considered that a dram weight of European Long Birthwort (*A. clematis* L.) drunk with wine and so applied was good against serpents and deadly things. Gerard states that '*Virginian Pistolochia has a strong and aromatic scent and is much used against bites of the rattle-snake or rather adder or viper, whose bite is very deadly. The root should be chewed and applied to the wound and also swallowed to quickly overcome the malignity of this poisonous and rapidly fatal bite.'* Significantly, modern research suggests that aristolochic acids are useful for the promotion of wound healing but not to counter snakebite. Of course none of these roots are really effective against acute snakebite and the wriggly roots really only suggest that the plant had grown in stony soil!

Some signs were deduced by associations which were of a dubious nature. Thus willow bark tea was recommended for stiff joints and rheumatism because the willow is supple and graceful (Kreig, 1965; Court, 1985). Others thought that it was because willow grew in dark, dank places. White willow or withy (*Salix alba* L. and closely related species, fam. Salicaceae) yields salicin, the precursor of salicylic acid and aspirin, and over the years willow has been considered useful for rheumatism, gout, fevers and aches and pains.

St John's Wort. *Hypericum perforatum*

St John's Wort is the yellow-flowered herbaceous perennial shrub *Hypericum perforatum* L. (fam. Hypericaceae) which was well known to the ancient Greek physicians for wound treatment. The leaves bear characteristic translucent oil glands which yield a pungent odour and resemble holes or cuts, hence the name Perforate St John's Wort. By association Paracelsus concluded that such appearance indicated potential value in the treatment of holes or other wounds in the skin (Court 1985); Wren also refers to the origin of the name St.John's Wort; this plant or wort was supposed to produce its red spots on 29th August, the day upon which St. John the Baptist was beheaded. Others believed that the herb should be hung in house windows on June 24th, the birthday of St. John, in order to drive away 'ghosts, devils, imps and thunderbolts' (Wren, 1956). In the Middle Ages the plant was called Balm of War and Balm of Warriors' Wounds and was used for deep sword wounds.The exact origin of such colloquial names is not clear. Modern research reveals volatile oils, hypericins, prenylated phloroglucinol derivatives and some flavonoids and the plant has been tested as an antidepressant and nervous system restorative and as an effective wound healer.

Pilewort or Lesser Celandine (*Ficaria ranunculoides* Moench., fam. Ranunculaceae) produces roots that enlarge to tubercles reminiscent of piles; hence the common name pilewort. Greenish (1933) referred to use of the fresh root as a remedy for haemorrhoids. Subsequent studies have shown the presence of saponins based on hederagenin and oleanolic acid which demonstrate antihaemorrhoidal action and accompanying tannins, the astringency of which potentiates such action (Wren, 1988).

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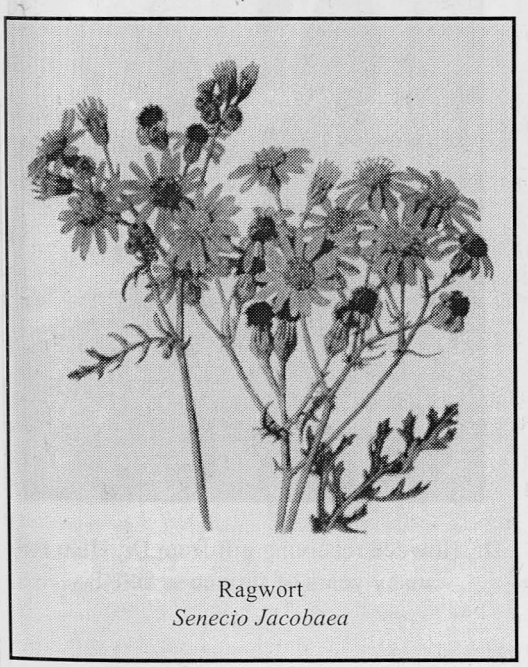
An even less scientific sign was attached to the Dandelion (*Taraxacum officinale* Weber, fam.Compositae). Because its occurrence was widespread in large numbers it was considered a cure-all and its bilious yellow flowers suggested value for liver complaints and jaundice. Its diuretic and mild aperient actions, due to bitter terpenes and terpene lactones, are consistent with a tonic. Country folk praised its virtues and prepared excellent dandelion tonic wines (Holtom and Hylton, 1979). Dandelion leaves are still used in some salads.

Myrtle (*Myrtus communis* L., fam. Myrtaceae) was used for women's complaints. There is some justification as the leaves contain tannins, flavonoids and volatile oil and antiseptic properties have been demonstrated. The use of Mistletoe (*Viscum album* L., fam. Loranthaceae) for impotence is much more dubious despite the presence of glycoproteins, polypeptides, flavonoids and polysaccharides.

Unsuccessful Doctrine

Certainly it is possible to quote many successful treatments consistent with the Doctrine of Signatures and such 'cures' are found in many books but there very many more instances where the plant agrees with the thesis but is either useless or downright dangerous. For example the yellow flowers and roots of Gelsemium or Wild Yellow Jasmine (*Gelsemium sempervirens* (L.) Ait., fam. Loganiaceae) containing toxic indole alkaloids would be dangerously misused for jaundice. It would also be foolish to use the currently spreading golden-yellow weed Ragwort (*Senecio jacobaea* L., fam. Compositae) internally as a panacea or for jaundice as the plant contains toxic pyrrolizidine alkaloids. Likewise the skullcap or helmet of Monkshood (*Aconitum napellus* L., fam. Ranunculaceae) and its roots containing toxic terpenoid alkaloids such as aconitine would be fatal if misused for insomnnia and headaches. Gerard (1636) was quite definite: '*Helmet-floure, or the great Monkes-hood, beareth very faire and goodly blew floures in shape like an Helmet: which are so beautifull, that a man would thinke they were of some excellent vertue, but* non est semper fides habenda front.' In short, do not always trust face values.



Ragwort
Senecio Jacobaea

How did our knowledge of herbal medicine really develop? It is difficult to be certain but probably empirical observation played a major role. For the primitive healer in a woodland glade or jungle clearing, plants producing rapid and obvious toxic reactions such as drastic purgation, violent emesis, vesication or sudden death would have been candidates for rapid rejection. Slower acting poisonous plants such as tobacco used in a period when life seldom exceeded 40 years would not present such an obvious cause-and-effect relationship. In the Middle Ages the medical schools trained physicians in the theories of the medical giants and especially Galen's hypothesis; such physicians usually ministered to the wealthy citizens, common people turning to the witch doctors, the wise-women, the tribal grandmothers, the travelling quacks and the herbalists. Often magical incantations and elaborate rituals were involved and in primitive communities worldwide still are. Persons such as Culpeper also involved astrology, arguing that the growth of the plants was affected by natural phenomena such as rainfall, sunlight and temperature and therefore by the movement of the planets.

The Role of the Doctrine

Plants have always been the major source of food, medicines, perfumes and dyes and in our modern era the source of precursors and ideas for many so-called synthetic compounds. With the worldwide revival of herbalism in a new, more rational form one must ask the question, 'What was the role of the Doctrine of Signatures?' Was it a placebo effect or psychological response to an illness or was it just an *aide-memoire* for the indigenous healer? I doubt the last suggestion as the experienced healer or apothecary would have known where the best wormwood, peppermint or marigold grew and certainly would differentiate closely related species. The Doctrine probably lost ground in the 17th century as carefully prepared floras replaced the ancient herbals based on mediaeval folklore. The

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accurate diagrams of Otto Brunfels (1488-1534)(*Herbarum Vivae Eicones* or *Living Pictures of Herbs*, 1530), Hieronymus Bock (1498-1554) (*De Stirpium*, 1551) and Leonhart Fuchs (1501-1566) (*De Historia Stirpium*, 1542) set a pattern for future botanical studies which were usually based on the physic gardens developed at European universities in the 16th century. The ancient copies of copies of copies were replaced by accurate diagrams drawn from real plants. The artificially exaggerated signatures disappeared from the scientific literature from the 17th century onwards although strange accounts were and still are available for the gullible public. Alleviation rather than cure was the more likely pattern in early medicine, the alleviation permitting nature to pursue its own healing processes; every practitioner probably developed his own range of herbs based on sound experience.

The Doctrine of Signatures may be an archaic reminder of past civilisations but it did provide an important step in man's understanding of natural history as it stimulated the detailed study of plants, so laying the foundations of the sciences of botany and horticulture. With the great developments in the knowledge of chemistry, it contributed to the newer fields of phytochemistry and pharmacology.

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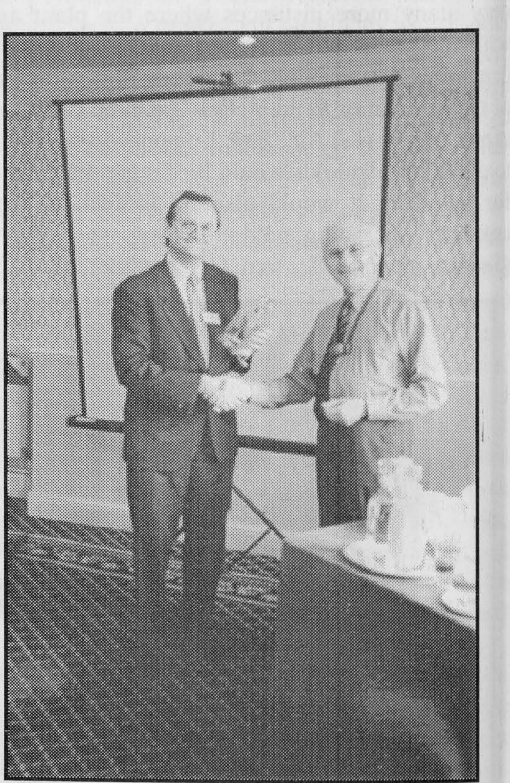
Christine and Lindsey Howden



Dr. Howden receiving gift from Dr. Hunt for many years of service to BSHP

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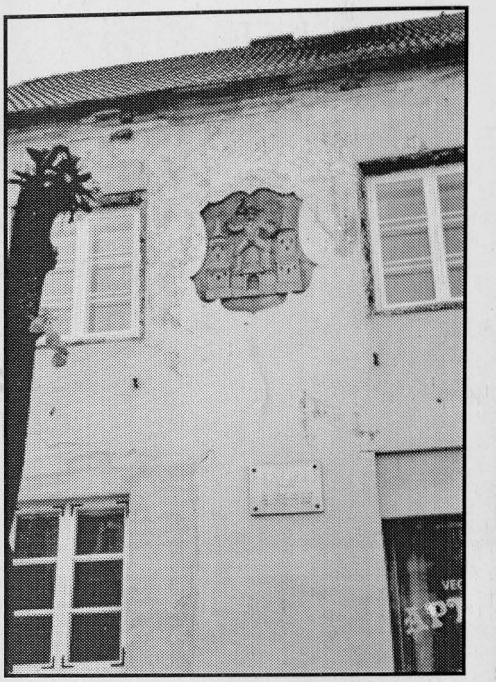
Pharmaceutical Society of Latvia



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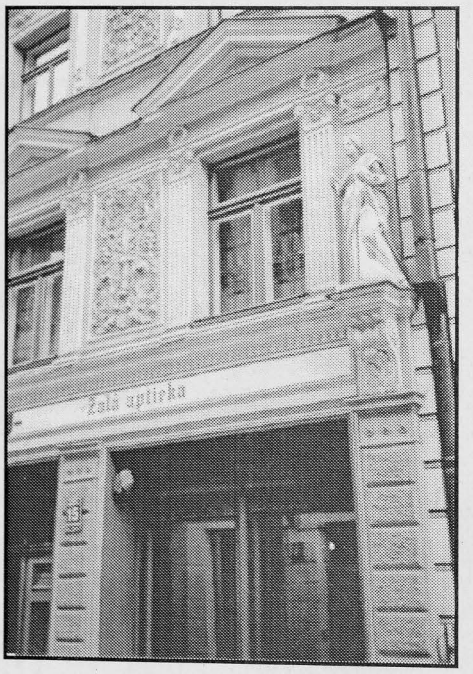
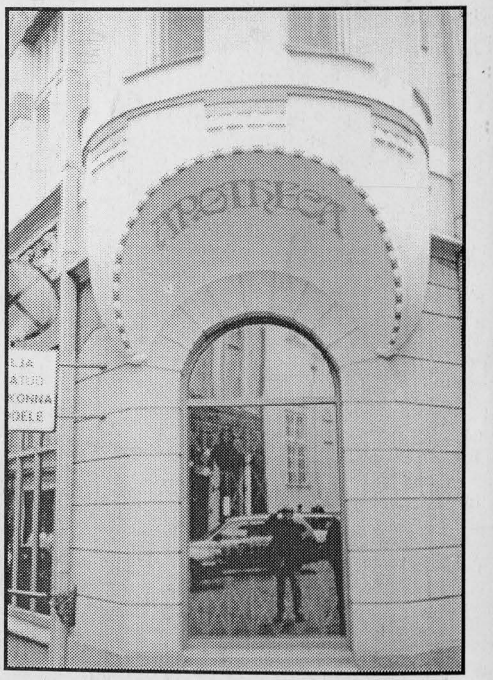


Zala Pharmacy, Riga, Latvia



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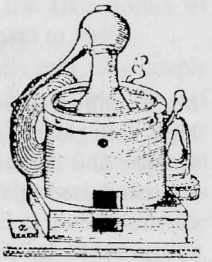

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Contents.

Book Review.

Geschichte der Pharmazie, Band I - Von den Anfangen bis zum Ausgang des Mittelalters,
by Rudolf Schmitz with the collaboration of Franz-Josef Kuhlen.
Govi-Verlag Pharmazeutischer Verlag Gmbh, Eschborn, 1998, pp.836. ISBN 3-7741-0706-8.

Professor Schmitz (1918-1992) was the founder and former director of the Institute for the History of Pharmacy in Marburg, Germany. His work has been published posthumously with the collaboration of Dr Kuhlen. The initial volume embraces the period from the earliest times up to the late Middle Ages.

The early historical introduction surveys primitive ideas of medicine including instinctive reaction to ill health, purposeful reactions such as painting the body with pigments, blood, plant juices and oils, scarification and tattooing. The foreign body theory and the resultant physical removal of worms, parasites and stones precedes notes on animistic and demonic medicines leading to ideas of disease, ritual and magic.

An overview of early Middle Eastern pharmacy in Mesopotamia, Egypt, Syria and Palestine and old Arabia with Hittite and Islamic and Persian medicine precedes a description of early Indian, Chinese, Teutonic and Celtic medicine. A more detailed examination of Greek (up to 250 BC), Roman (up to 400 AD) and Byzantine (330-1453) medicine follows. Description of Arabic medicine at the Salerno medical school and in Spanish Toledo in the early Middle Ages (600-1300) prepares the reader for the assimilation phase of the Greek, Roman and Arabian concepts and the development of the Latin-dominated education and medicine in Europe. The impact of monastic medicine and its practice up to the early 18th. century is also considered.

In this survey medical philosophies and ideas such as miracles, the yin-yang principle, the Chinese five element system, temple medicine, humoral pathology and the four element theory, alchemy, hygiene, diets and drug therapies are described. Important early texts mentioned include the Shen-Nung Ren-tsao Ching, the Hippocratic Corpus, the Canon of Medicine, the Lorscher Compendium, Strabo's Hortulus, medical encyclopedias and the writings of great scholars such as Pythagoras, Empedocles, Hippocrates, Plato, Theophrastus, Pliny, Dioscorides, Galen, Rhazes, Avicenna, Mesue (senior and junior), Geber Averroes, Maimondes and Constantinus Africanus are outlined

The second part of the book describes and discusses Western pharmacy in the 13th.-16th. centuries. Commencing with the differentiation of pharmacy from medicine in 11240 and its independent professional, the study considers basic educational concepts, commentary, disputation and experimentation, development of pharmaceutical terminology and lists early drug books such as antidotaria and compendia. Plant drugs, simples and honeys, and compound medicines, drug abuse. Weights and measures are reviewed before considering the growth and status of pharmacy from monastery to town and state practice with guild rules and legislation. The volume closes with drug trading, and drug taxes, military practice and a reference to the great epidemics.

Although this well presented and illustrated book is necessarily slanted towards German pharmaceutical history, it provides a mine of information on areas of the world. An extremely valuable advantage is the extensive listing of 185 pages. The book is well indexed but there are no English or French language summaries. However the German is easily readable. I look forward to Volume II which runs from 1500 to the present time with eager anticipation.

W.E.Court.

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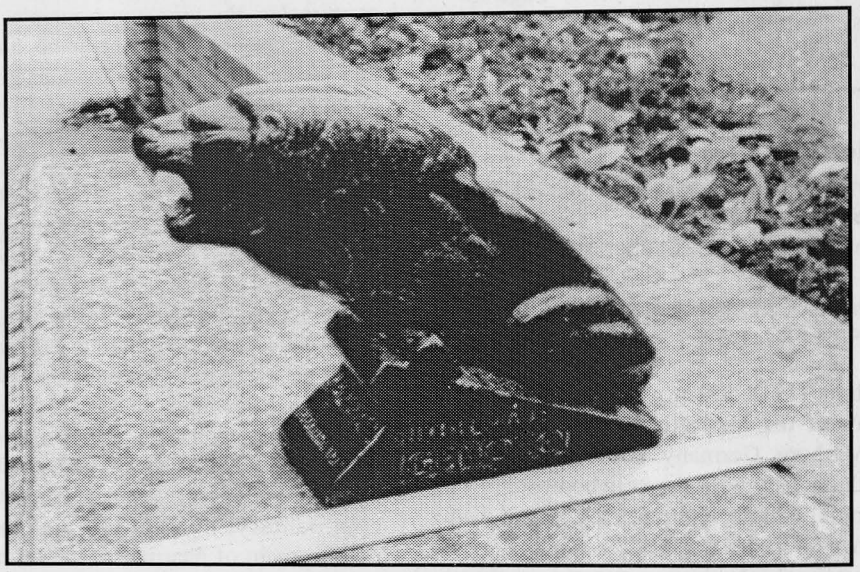
The Genozo Lion

By Norma Cox.

My cousin purchased a blue ceramic lion, 8 inches high, with gleaming white teeth, the word Genozo on its base and Ashstead Potteries stamped underneath. He recognised this lion from an old photograph of a chemist's shop in Exeter. Since I am a pharmacist, my cousin asked me if I knew anything about it.

Genozo was the name of a toothpaste made by Genatosan Ltd., in Loughborough.[1] This company was founded in 1917 and also marketed Formamint lozenges (Wulfing brand), Genasprin the safe aspirin, and Sanatogen, the true tonic food.[2]

The Genozo lion was made by Ashstead Potters Ltd. in Ashstead, Surrey, the company trading from 1923 to 1935 . It was started by Sir Lawrence and Lady Weaver to train and employ disabled ex-servicemen from the Great War, and manufactured pottery.[3] The Genozo lion was designed by Percy Metcalfe, a sculptor, medallist and stamp designer.. Whilst at Ashstead he designed the Wembley lions for the British Empire Exhibition of 1924-5[4]; the Genozo lion is similar in design.



The Genozo brand is mentioned in the Sangers' lists for 1930, 1931, 1935, 1938, 1941 and 1942.[5] In the 1938 it lists it as" Genozo toothpaste a known, approved and admitted remedy, may only be sold unstamped by persons entitled so to do under the Medicine Stamp Act."

The *Chemist and Druggist* of 1929 mentions a Genozo dentifrice and mouth-wash tablets and that "both products are protected under the scheme of the Proprietary Articles Trade Association. They are extensively advertised, particularly the toothpaste, which represents a new idea in dentifrices since it contains a bacteriological emulsion successfully used in the treatment of pyorrhoea." [6]

There are two letters in the *Chemist and Druggist of* 1930 about Genozo, the first from R.Cecil Owen.[7] He writes, "In the present conditions of hard times when pharmacists find that drapers, grocers etc. are busy selling goods that in previous years were confined to pharmacies, it is altogether to the good that a much advertised proprietary can only be obtained in pharmacies. It is surely up to all self respecting chemists to support any firm which refuses to sell goods to non-pharmaceutical vendors. There is a moral in this for the well known firms of X,Y, and Z whose representatives call not only on chemists but upon any and every retailer who will handle their goods."

The second letter from 'A British Pharmacist assures "my fellow pharmacists who doubt the value of pushing 'chemist-only' lines that it is a profitable proposition. Customers return to me for further tubes because they cannot get it from hairdressers, grocers or sixpenny stores. I have the satisfaction of knowing that I am encouraging other manufacturers to emulate the example of Genatosan and give chemists a square deal."

Genozo toothpaste was produced until 1960 when the cost price was £12 per dozen tubes;[8] purchase tax was £3 per dozen and the retail price £1. 8s. each.

I have been unable to find the formula for Genozo toothpaste and would welcome any information on it.

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Prescription Books as Historical Sources

Stuart Anderson & Christine Homan

Prescription books represent a rich and varied source of historical data, but to date have received only scant attention from pharmaceutical historians. They had, of course, to be kept at every chemist in the country. Large numbers of them survive, although some are more accessible than others. In this paper we review the main holdings of prescription books, consider some of the ways in which they have been used, and present the results of an analysis of the prescription books from a single shop between 1910 and 1980, using a method developed from previous studies which we hope may be taken up by others.

Sources of Prescription Books.

A recent survey of surviving pharmaceutical archives by the Business Archives Council provides the most comprehensive account of prescription books; it includes both nation national collections and smaller ones held in local public record offices. The two largest single collections are those available through the library of the Wellcome Institute for the History of Medicine, held either in the Western Manuscripts Collection or the Contemporary Medical Archive Centre (CMAC), and in the museum of the Royal Pharmaceutical Society.

The collection held by CMAC is diverse with varying runs from chemists' shops in both London and the provinces.[1] It includes those of Thomas Tanner Nicholson Ltd. of London NW1 from 1870 to 1963, Armitage Dispensing Chemists of Blackheath, 1899 - 1943, Faller's Pharmacy in Lymington, Hants., from 1932 - 1979, H.C. Croadsell's in Cockermouth, Cumberland from 1923 - 1950, and Savory and Moore's in London, SW1 from 1912 to 1944. Recent acquisitions by CMAC include those from the pharmacy at Harrod's from 1935 to 1977, whilst the Department of Western Manuscripts has recently acquired prescription books from John Harley, dispensing chemists of London from 1885 to 1926.[2] Access to these collections is via the Poulter Room of the Library.

Access is also possible to those of the Royal Pharmaceutical Society but prior arrangement must be made with the museum staff. This collection consists of some 203 volumes, but some need conservation work before they can be made available.

The earliest date back to 1819 and the most recent to 1971. Some cover an extended period for a single business, for example the run of sixteen prescription books for Ragg Ltd. of Edmonton from 1880 to 1969, or the fourteen books from a Gloucester business from 1834 to 1914, and the seven from John Bell, Hills and Lucas between 1873 and 1901. Shorter runs include four books from John Major Randall in Farnham between 1852 and 1868, and the five books of Christopher Gould in Godstone, 1924 to 1949.

Some large collections are currently split, for example the prescription books of Martindale and Co., of London W1 for the period from 1889 to 1931; 39 are held by the Pharmaceutical Society and those from 1936 - 1970 are held by CMAC. Of prescription books held in local Record Offices, examples include the books of Hickman and Son of Newbury, 1901 - 1979, deposited at Berkshire Record Office, those of Sydney J.Buckle of Great Torrington, 1886 - 1947 in the North Devon Record office, and the books of W.T.Hind of Leicester in the Leicestershire Record office.[3,4]

Collections of prescriptions continue to be deposited around the country. Recent acquisitions include the prescription and account books of Flanders, chemists and opticians, of Cambridge, 1880 - 1962, now at the Cambridgeshire County Record Office, those from the Boots branch at Ilfracombe, 1926 - 1996 also at the North Devon R.O., and the records of J.Griffith Richards of Hastings at the East Sussex R.O.[5] It is likely that many others are to be found on the premises to which they relate or are held in private collections.

Over the years considerable effort has gone into the analysis of these books, and some of these have been published. [6,7] The publications present methodical analyses of the books concerned, covering area served, patients, the prescriptions dispensed divided into proprietary and extemporaneous preparations. They provide a rich insight into pharmaceutical practice in a particular place at a particular time, but it is not usually possible to generalise from the data, or to build up a larger picture over a broader geographical area or extended period of time.

Uses of Prescription Book Data.

The uses to which this data has been put are many and varied. They have for example been used to consider the extent and nature of use of specific substances, such as opium and other narcotics, potassium bromide and ergot preparations. They may be used to examine the dosage forms used at a particular time and place, and to review the extent to which non-medicinal items were used. Perhaps they have been used most frequently as the source of specific recipes and formulae. We can explore the extent to which proprietary preparations were used at a particular time, and which were the most popular. Prescription books can also give us an indication of the extent non-allopathic medicines were used. Finally, comparisons between the books of two or more pharmacies in the same town at the same time can be very informative, perhaps telling us something about possible differences between medical treatments for rich and poor.

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As already mentioned a number of long runs of these books from particular pharmacies exist which provide the opportunity to examine change over time. One such are the prescription books of a branch of Boots on Putney High Street, south west London which re-located in 1982. The earliest prescription dates from 1908 and the latest ones to 1982.

This period covers a time of substantial change in the practice of community pharmacy, and the dosage forms dispensed. The use of solid dose preparations such as tablets was minimal at the beginning of the century, the majority of prescriptions being for oral liquid preparations, but by the end of the century the situation was reversed. When did this change occur, how rapid was the change, and what was the extent of the change ? We recognised that this material might provide the answers and offer the opportunity to 'map' changes in the frequency of use of particular dosage forms during the twentieth century.

Method.

As an analysis of all the prescriptions in all the books was an enormous task it was decided some sort of sampling frame was needed. An initial analysis was carried out using prescription books at ten year intervals from 1910 to 1980. The books for these years contained varying numbers of prescriptions. Again to limit the work involved and to avoid the impact of any seasonal variation, the first 300 prescriptions for each year were analysed. This typically represented one months worth of prescriptions for January each year.

To facilitate the interpretation of prescriptions an an analysis sheet was prepared which listed all dosage forms which appeared in official publications during the period obtained from the *British Pharmacopoeias* of 1898 to 1978. Space was included for additional categories such as veterinary products and sundries. This gave a maximum of 76 categories: each of the 300 prescriptions was placed in one of them. To aid analysis, the categories were re-arranged into eight larger groups each of which accounted for at least 2% of all prescriptions at some point. The principal pharmaceutical dosage forms in the eight groups are listed in figure 1.

Results

The numbers of each type of dosage form based on the 300 prescription-sample were converted to percentages for each of the eight groups. The results are presented in Table 1. This suggests that change begins to accelerate during the 1930s and that they are effectively complete by the 1970s. Although there is considerable difference in the decades a number of clear trends are apparent.

It can be seen that the proportion of oral liquid medicines, principally mixtures, slowly diminishes during the century, decreasing below 50%of all prescriptions dispensed around 1950. At the same time the proportion of solid oral preparations, principally tablets, steadily increases until rising above 50% around 1960. Furthermore, the proportion of prescriptions for topical liquids and solids halves over the period, from about 15% in 1910 to about 9% in 1980. The proportion of mouth products reduces from about 7% of the total in 1910 to less than 1% in 1980. Finally, the proportion of products for the eyes, nose and ears more than doubles, from around 3% to 8% in the same period.

These trends can be seen more clearly when data for the period is plotted as a graph. Additional data is provided if the exercise is repeated for some intervening years especially during the period of greatest change, that is for 1945, 1955, and 1965. For the graph, eye preparations have been combined with those for the ear and nose and mouth.

Figure 1 : Principal Groupings of Dosage Forms

1. Oral Liquids	2. Oral Solids	3. Topical Liquids	4. Topical Solids
confections	cachets	applications	creams
draughts	capsules	collodions	dusting powders
elixirs	granules	embrocations	gels
emulsions	pills	emulsions	ointments
extracts	powders	liniments	pastes
glycerins	tablets	lotions	poultices
linctuses	other	paints	other
mixtures		solutions	
solutions	**6. Mouth Preps**	spirits	
suspensions		sprays	**8. Nose and Ear Preparations**
syrups	dental pastes	other	
tonics	gargles		
other	insufflations	**7. Eye Preps**	ear drops
	lozenges		nasal drops
5. Other Preparations	mouth washes	eye drops	nasal douches
	throat paints	eye lotions	nasal insufflations
	tooth powders	eye ointments	nasal ointments
everything else	other	other	other

Discussion

The data here presented relates to one community pharmacy in one part of the country, but how typical is it of developments elsewhere? There is a need to repeat this analysis elsewhere using prescription books from different types

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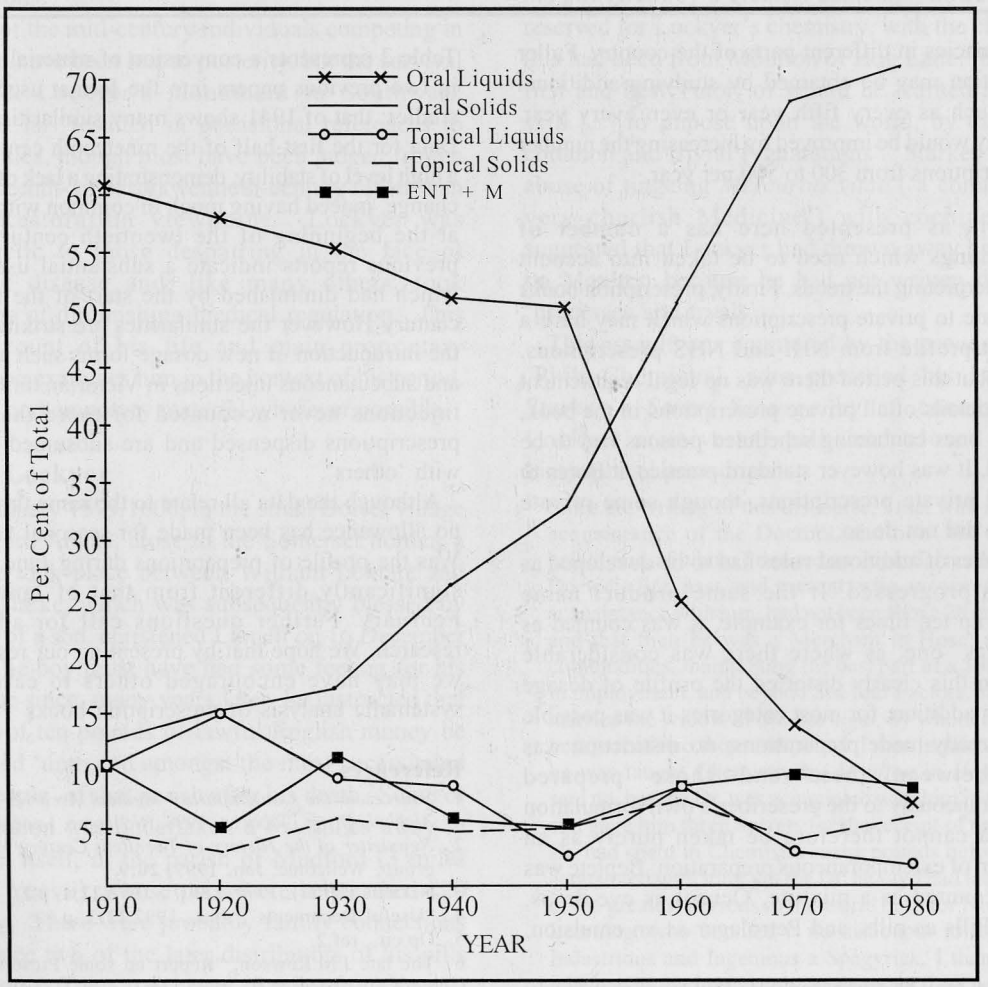
Table 1 : Numbers of Principal Dosage Forms in Prescription Books 1910 to 1980

	1910	1920	1930	1940	1950	1960	1970	1980
Oral Liquids	183	176	166	152	150	74	42	22
	(61.0%)	(58.7%)	(55.3%)	(50.7%)	(50.0%)	(24.7%)	(14.0%)	(7.3%)
Oral Solids	37	46	50	79	97	149	202	212
	(12.3%)	(15.3%)	(16.7%)	(26.3%)	(32.3%)	(49.7%)	(67.3%)	(70.7%)
Topical Liquids	32	45	29	27	8	27	8	6
	(10.7%)	(15.0%)	(9.7%)	(9.0%)	(2.7%)	(9.0%)	(2.7%)	(2.0%)
Topical Solids	14	10	18	15	18	21	12	20
	(4.7%)	(3.3%)	(6.0%)	(5.0%)	(6.0%)	(7.0%)	(4.0%)	(6.7%)
Mouth	21	13	21	9	7	4	2	1
Preparations	(7.0%)	(4.3%)	(7.0%)	(3.0%)	(2.3%)	(1.3%)	(0.7%)	(0.3%)
Eye	8	1	13	8	12	14	18	19
Preparations	(2.7%)	(0.3%)	(4.3%)	(2.7%)	(4.0%)	(4.7%)	(6.0%)	(6.3%)
Nose and Ear	2	2	1	1	1	1	8	5
Preparations	(0.7%)	(0.7%)	(0.3%)	(0.3%)	(0.3%)	(0.3%)	(2.7%)	(1.7%)
Others	3	7	2	9	7	10	8	15
	(1.0%0	(2.3%)	(0.7%)	(3.0%)	(2.3%)	(3.3%)	(2.7%)	(5.0%)
Total	300	300	300	300	300	300	300	300



Graph: Principal dosage forms in prescription books 1910-1980

Prescription books from Boots, Putney High Street, London. (private collection)

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Table 2 : Comparison with Previous Studies of Prescription Books

	1809*	1823*	1835*	1850*	1910**	1940**	1941***	1950**
Oral Liquids: Mixtures & Draughts	40	38	39	47	61	51	40	50
Oral Solids: consisting of	43	51	49	44	12	26	35	32
Pills	33	38	37	39			1	
Powders	10	13	12	5			4	
Tablets & Capsules							30	
Topical Liquids Lotions, Linaments etc..	6	5	3	4	11	9	7	3
Topical Solids: Ointments, Creams	4	2	4	2	5	5	#	6
Mouth preparations	#	#	#	#	7	3	#	2
Eye preparations	#	#	#	#	3	3	3	2
Nose & Ear preps.	#	#	#	#	2	1	3	1
Others	7	4	5	3	1	3	11	2

Notes : Figures are percentages : * 1995 study : ** present study : *** 1996 study : # not recorded

of pharmacies in different parts of the country. Fuller information may be obtained by studying additional years, such as every fifth year or even every year. Accuracy would be improved by increasing the number of prescriptions from 300 to 500 per year.

The data as presented here has a number of shortcomings which need to be taken into account when interpreting the trends. Firstly, prescription books only relate to private prescriptions which may have a different profile from NHI and NHS prescriptions. Throughout this period there was no legal requirement to enter details of all private prescriptions in the book, only the ones containing scheduled poisons had to be recorded. It was however standard practice at Boots to enter all private prescriptions, though some private chemists did not do so.

A number of additional rules had to be developed as analysis progressed. If the same product name cropped up ten times for example, it was counted as ten not as one, as where there was considerable repetition this clearly distorted the profile of dosage forms. In addition, for most categories it was possible to have ready-made preparations; no distinction was made between these and those prepared extemporaneously to the prescriber's own formulation The data cannot therefore be taken purely as an indication of extemporaneous preparation: Beplete was simply counted as a mixture, Ocusol as eye-drops, Blaud's Pills as pills, and Petrolagar as an emulsion, and so on.

Our data may be compared with that from previously published studies, although few cover the same period. Table 2 represents a conversion of material presented in two previous papers into the format used in those studies; that of 1941 shows many similarities to ours. Data for the first half of the nineteenth century show a high level of stability, demonstrating a lack of dramatic change, indeed having much in common with our own at the beginning of the twentieth century. These previous reports indicate a substantial use of pills which had diminished by the start of the twentieth century However the similarities are striking despite the introduction of new dosage forms such as cachets and subcutaneous injections in Victorian times. In fact injections never accounted for more than 1% of prescriptions dispensed and are subsumed with 'others'.

Although the data all relate to the same time of year no allowance has been made for seasonal variations. Was the profile of preparations during June and July significantly different from that of January and February. Further questions call for additional research. We hope that by presenting our results here we may have encouraged others to carry out a systematic analysis of prescription books

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Lionel Lockyer (1600-72) & his Pillulae Radiis Solis Extractae

Dr A. S. Hargreaves

Introduction

The seventeenth century was to many in England a 'world turned upside down', where experience, evidence and experimentation were challenging tradition and conventional wisdom. Disillusion with privileged bodies and monopolies led to a reduction of their authority, with consequent lessening of regulation. European empirics, opportunists and charlatans rapidly availed themselves of the loss of power of London's College of Physicians, as did indigenous chemists and artisans who could now set themselves up as 'physicians' without fear of being hounded. A free market for medical services was arising, enthusiastically proclaiming its skills and new preparations.

Many of the mid-century individuals competing in this arena have been lost to posterity, but the survival of Lionel Lockyer's monument in Southwark Cathedral has resulted in occasional references to his activities, though most have been judged from a late nineteenth- or early twentieth-century rather than a post-Restoration viewpoint. Lockyer was sympathetic to those despairing in the face of epidemic disease and, like many others, took advantage of diminishing medical regulation. This brief account of his life and main proprietary preparation examines him in the context of his period, and uses contemporary material wherever possible.

Lionel Lockyer

On 28 January 1599/1600, in the small Dorset village of Bradford Abbas, close to the Somerset border, a marriage took place between William Lokiare and Johane Clarke, which was subsequently blessed by the birth of a son, christened Lionell on 16 December 1600.[1] The boy must have had some feeling for his birthplace since, many years later, he instructed that the sum of ten pounds of lawful English money be distributed 'unto and amongst the most necessitated poore people' of that parish after his death.[2] Some of his education was undertaken a few miles away in Somerset itself, in the parish of Mudford (3 miles NNE of Yeovil), whose poor were bequeathed £20 similarly. There were probably family connections there, since two of the later distributors of his pills were Thomas Trent at Ilchester (5 miles from Yeovil) and Thomas Lockyer in Wellington (7 miles from Taunton), both described rather loosely as 'cousin'.

Lionel Lockyer's adult activities before the Restoration are uncertain, but are suggested in two secondary sources, neither of which lacks bias. The first is George Starkey, a competitor of Lockyer with a pill of his own (based on opium), and who has since been described as a complex character prone to controversy. Responding to a letter of 7 November 1664 supportive of Lockyer, Starkey described him as '(*quondam* and lately) Botcher, now *(tandem aliquando, nuper quidem*) dressed up with the title of Licensed PHYSICIAN', and scorned his pill:[3]

> in praise of which he hath stitcht up the names of as many Disease, all curable by that trifle [...] as ever he made use of patches for the Botching up a Beggars Coat, (to which sort of people, as my undeniable Information assures me, he was at the best of his former Condition, a denominated *Taylor.*)

The several references to butchery/botchery are no more than word-play, attacking his rival's involvement in physic and those 'fatal Tragedies' which had apparently resulted from the effects of his pill. Starkey's greatest contempt, however, was reserved for Lockyer's chemistry, with the claim that this had been from Moulton of Hog Lane, 'being his first and best Tutor; of whom he learned his chief skill [...] to impose upon the world, by disguising common and trivial Preparations'. Starkey cited an abuse of tingeing *Mercurius vitae* ('a common and very churlish Medicine') with cochineal, and suggested that Lockyer had thrown away his money on Moulton because he had not written down his 'processes and tryals'.

This assault was countered by the pseudonymous 'Philo-Chemicus', who preceded his attack on Starkey's *Smart Scourge* by an encomium on Lockyer's universal pill, and closed with a biographical postscript:[4]

> Since the writing of this discourse, I met with an antient acquaintance of the Doctors, and now his very near neighbour, of whom I desired an impartial account of the Doctor's life, past, and present; who answered, that his acquaintance with him, had not been above 28 or 29 years, and that then he was a Merchant in Hose, and other commodities, maintaining the best part of a 1000 people in imployment, and beyond Sea four Factors, and that he married the widow of Mr. *Springal,* by whom he had the best part of two thousand pound. I then inquired whether he was taught Chemistry by *Moulton* in *Hog-lane,* he said no, but the Dr. was acquainted with him in Germany, and gave him three Secrets for the receipt of one; for the Dr. had spent in Chemistry many pounds before he was acquainted with him; yet the Dr. he sayd had taught some of the greatest persons in the world both for Nobilite and Learning, who counted it no dishonour to learn of so Industrious and Ingenious a Spagyrick. I then inquired whether he had not lately been reduc'd to poverty, he said no, for he had lived in that Parish [St Thomas, Southwark] the best part of twenty years, and that ever

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since he had given thirty two shillings a moneth where he saw need ....

Philo-Chemicus was clearly a supporter, but there is some external evidence in corroboration. Lockyer's will of 4 March 1672 bequeathed the generous sum of £200 to his 'Daughter in Law Ellinor Springall the late wife of my Son in Law John Springall Deceased'; the term 'Son in Law' then could quite correctly be interpreted as today's 'step-son'. Another bequest, this time to his nephew John Watts, was 'one fourth-part of and in the good ship called the *Bartholomew of London* and of and in the Tackle furniture and appurtenances thereunto belonging', which could sustain the claim that Lockyer had formerly been a successful merchant, with overseas trading connections. Starkey's reference to a 'denominated *Taylor*' may have been a sneer, but does reinforce the textile link.

Crellin and Scott have already found of particular interest the attack penned in 1665 by William Johnson, chemist at the Laboratory financed by the London College of Physicians. In the context of traditional chemists decrying the 'new' and vociferous chemist physicians, Johnson's inclusion of Lockyer's name in his broadside against George Thomson and Thomas O'Dowde (both serious-minded chemists) suggested to them that Lockyer was another key figure in the chemical medicine movement, although Johnson's criticisms of him stemmed from perceived overcharging and his published denial of the pills' main active ingredient.[5] Lockyer's demonstration of calcining his powder before the Court, at Southampton House on 13 June 1664 (cited in the supportive November letter already referred to), should be evaluated in the light of Charles II's well-known interest in chemical experiments, but would not have been requested if he had lacked standing.

Lockyer's involvement in physic is reasonably well substantiated. Starkey admitted that his rival had been granted an episcopal licence to practise medicine outside the seven-mile radius of St Paul's (following the Henrician statute of 1511), but grumbled that he did not seem to have understood the geographical restrictions. The fact that this licence has yet to be traced does not necessarily mean that Lockyer was practising under false pretences, since not all these licences have survived. Starkey would hardly have ignored such an opportunity for attack had there been no formal authorization, and, as Crellin and Scott have already pointed out, if Lockyer's testimonial was acceptable for the medical licensing of his friend the apothecary Thomas Fyge, in December 1661, the church authorities must have regarded him as reasonably reputable. He also supported the application of Charles Willcox in April 1669.[6]

Not only does the burial register of St Saviour's, Southwark, list him in May 1672 as 'Lyonell Lockier D[r] of Physick',[7] but the surround to his frontispiece portrait ('PHYSITIAN - LIONEL - LOCKYER') and his will leave us in no doubt of his own views on the matter:

> I Lionell Lockier of the parish of St Thomas in Southwarke in the County of Surry Phisitian [...] Item I do give and bequeath to the said John Watts all and every my Books and Manuscripts and also all my Pills and other preparacons for Physicke and all my Vessells Boxes Glasses implements and other materialls incident or belonging to my Art or practise of a Physitian be they of what nature or kind soever Together also withall my secrets receipts and other thing and things whatsoever wherewith it hath pleased God to blesse mee in order to the performance or management of the aforsaid Art or practise.

Lockyer's faith, a driving force in his life, was given greater expression through his move from mercantilism to physic via medical chemistry. His only known pre-Restoration publication is an eleven-verse ballad sheet of June 1652, attacking hypocrites and directed to be sung (perhaps appropriately) to the tune of the *Three Cheaters:* the professed support for those poor and hungry ignored by the fashionably-dressed and over-fed owes more to religious rather than medical sentiments, but contains seeds of his later philanthropy. Even at this stage, he was facing attack, since the last verse implies that there had been accusations of association with the Ranters, a contemporary anarchic, quasi-religious sect:[8]

> Now all that know what Ranting means,
> Must needs confesse it is those sins,
> When one riotously hath spent
> That which his fellow-creatures want;
> But this the Saints are frequent in,
> And guilty of that Ranting sin.
>
> Now if you think me much too blame,
> I shall not spare to write my name;
> I will not bring my self in thrall;
> Men do me *Lionel Lockier* call;
> Others by the name of *Rant,*
> Such holy words flow from the Saint.

Preparation, marketing and distribution

The pills were prepared in Lockyer's laboratory in St Thomas's parish, Southwark, over against the Meal-Market, at the Sign of the Three Boars' Heads. He worked unaided at first, but was later joined by his nephew John Watts, who acted as chemical operator and lived with him. The scale of distribution, however, suggests that considerable labour would have been necessitated. As might be expected, few details were divulged about constituents and chemical processes; the only thing certain is that the pills were made with great expense and 'much

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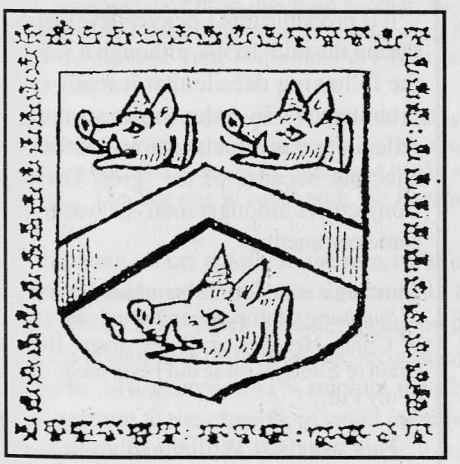
Pains, Time and Operating in the Fire', which became tedious in his old age.[9] Lockyer's apothecary friend Thomas Fyge (of Fleet Street, later without Bishopsgate-street at the Sign of the Sugar Loaf), who had already been allowed to manufacture and sell another of his friend's lesser preparations, was eventually to share the secrets of production, and had begun to produce the pills at his own house before Lockyer's death in 1672.

Latten boxes (i.e. of thin sheet metal, identical with or closely resembling brass) containing 1/4oz. of pills, so approximately 100 in number, were sealed with his coat of arms and cost 4s. each, accompanied by a copy of the pamphlet which both promoted the product and suggested dosages. Half-boxes were later available at 2s. for fifty. The 4s. box was supposed to last for about three weeks, which suggests an average of about five pills a day. In fact, four were regarded as 'a good ordinary Dose', which contained some six grains. They were claimed to be quite safe, even for neonates, with a shelf-life of 100 years. Promoted as a universal medicine of an 'All-healing Virtue', they could also serve as a preventative and should therefore be taken additionally *before* illness struck — sharp marketing that took advantage of prevailing fears of contagion.

The device for a coat of arms — 'a chevron between three boars' heads either erased or couped behind the ears and with no tinctures seen' (Fig. 1)



Device used in pamphlets and on pill-box seals.

— was obviously inspired by the sign at his laboratory, but Crellin and Scott's 1972 enquiries of the Richmond Herald revealed that they were not recorded for a family of Lockyer, nor did Lionel Lockyer ever establish a right to arms either by grant or descent. However, advertising and showmanship were necessary requisites in the seventeenth-century medical marketplace, and its demands could provide some justification for his adoption of the device. A logo would have been invaluable when many were illiterate, and such a shield would have been easily recognizable. It appeared outside his dwelling, on the pamphlets, and also on the pill-box seals, to authenticate provenance.

Although their full title was *Pillulae Radiis Solis Extractae,* the pills had a shorter eponymous alternative. Many proprietary preparations bore their inventors' names as part of the promotion, but Lockyer seems to have an extra reason: .

> *Absolom,* because he had no Son to keep his name, he Erected a *Pillar* and called it after his own Name,
>
> And I have had *Sons,* but *They are not,* And so I shall call the Pill *after my own Name.*

Although he had grandchildren living at the time of his decease, one of whom was christened Lockyer, they were the issue of a married daughter Dinah (wife of James Byer). Eponymous labelling was one way of perpetuating the family name when the male line faltered.

The pamphlets accompanying the latten boxes were no mere hand-bills, as copies from November 1665 and May 1667 show; there had been earlier editions in November 1662 and May 1664, and the cited cases and distributors were probably reviewed on a regular basis. The November 1665 version, which depicts him in relatively sober dress and his own shoulder-length hair (Fig. 2), has fourteen pages of text, one and a half of distributors' names, a postscript

Lionel Lockyer

explaining the addition of his portrait and refusal to respond to any further letters asking how to take the pills, and a transcription of the supportive letter of 7 November 1664. According to Starkey, it cost £37 to produce the pamphlet, which reflects the size of its make-up and implies considerable promotional exercise.

Distribution was impressive. A coloured print in

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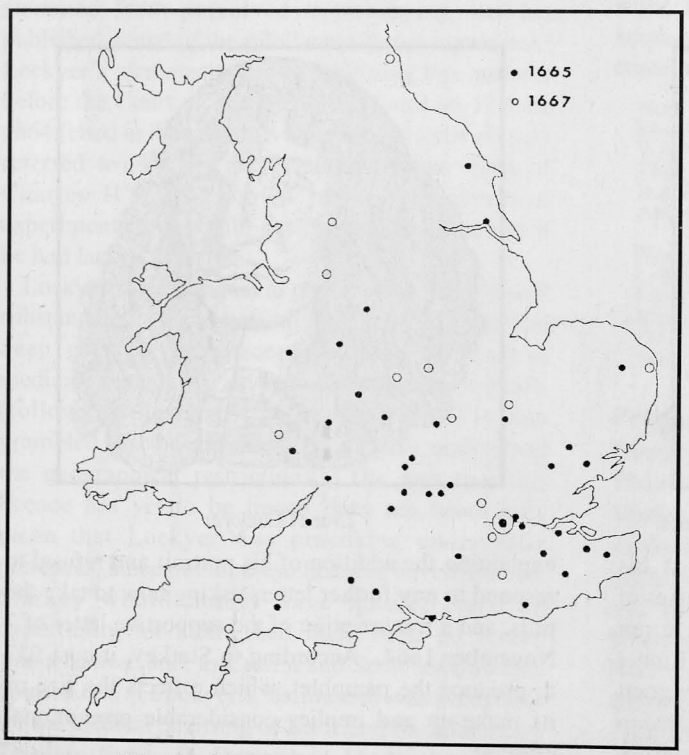
the Guildhall Library (London) purports to be Lockyer doing his rounds on horseback, with a young assistant, but there is no satisfactory confirmation that this was the chemist-philanthropist rather than just one of the horse-mountebanks so prevalent then in London. More certainly, by 1665 Lockyer had six retail outlets in London other than his own premises, and another forty or so in the provinces, as far west as Somerset and as far north as Hull. Nor were they just county and cathedral towns such as Gloucester and Salisbury, where there were reasonably-sized populations. Thame, Tring, Wendover (Buckinghamshire), and Town Malling and Cranbrooke (Kent) had local suppliers, as did Dunmow and Saffron Walden (Essex). Although this was a full century before the transport infrastructure of turnpikes and canals was in place, and road surfaces were not good, there had been some road widening, the first Turnpike Act had been passed (with noticeably beneficial results in Hertfordshire), and travel was increasing between London and the interior; lighter goods went by road rather than river, by waggon or packhorse.

If Lockyer had once been a successful hosier, his mercantile experience was not being allowed to go to waste, though whether he himself organized his retailers or whether this was undertaken by his later wholesaler, Mr Eves, is unknown. By 1667, there were thirteen London and forty-nine provincial outlets, down to Exeter and up to Newcastle (Fig. 3). There was also an outlet in Dublin.

Trades or occupations for his listed provincial retailers were not always specified, so while there are several verifiable booksellers, there is no apparent dependency on those associated with the textile industry with whom there might have been earlier links. Even at this stage, before the rise in newspapers, the sale of proprietary medicines was becoming an important aspect of printers' and booksellers' businesses. Whether or not Lockyer's shift to chemistry and physic was related to the mid-seventeenth century crisis in a once-flourishing export of cloth to the Baltic area remains unclear, but his second career did not lack energy or enthusiasm.

Prior to his death, the pamphlet had received a certain amount of editorial revision, the text being tightened and clinical cases moved to a block at the end. After 1672, both testimonials and retailers were augmented as Watts and Fyge marketed the pills extensively. In a posthumous edition of the pamphlet (probably published in 1676), 120 retailers were named, of which eleven were situated in what would now be regarded as central and Greater London, five in Ireland, two in Scotland (with authority to appoint others in that kingdom), and one each in Barbados and Jamaica.[10]



Distribution of suppliers in 1665 and 1667

Contents and usage

It is probable that Lockyer developed his Pill during the mid-1650s, although it was not until the following decade that it really came into prominence. In order to thwart the counterfeiters, he was reluctant to reveal the constituents, but because of the 'great Disputes and Conjectures amongst men' he was forced into some comment:

> Some say it is made of *Turpenthum Minerale,* Others, of *Sulphur of Antimony,* and some say it is made of *Crude Mercury* or *Quick-silver:* But not one Grain of *Either* of these did I ever use to the making of my Pill.

This incensed William Johnson as chemist to the College of Physicians. Aggrieved by Lockyer's high charges of 16s. per oz. for something that he felt could be purchased in any apothecary's shop for three pence, he took issue with the apparent claim that there was no antimony present, even to the point of an experiment in the College's Public Laboratory before the Fellows. The trial was a little shaky by today's analytical standards. Half an ounce of the pills was dissolved in

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spirit of wine to remove the mucilaginous material; this left a powder which conformed in colour and weight to *Vitrum Antimonii* or glass of antimony (fused oxide and sulphide). Visual comparison was made with an equivalent amount of known glass of antimony, pulverized. Both powders were then melted down. The residue from the pills yielded 2 drachms 11 grains of pure regulus of antimony, and that from his comparative powder 2 drachms 6 grains. This was regarded as conclusive proof that the pills were 'altogether Antimonial', and 'nothing else but *Vitrum Antimonii*'.[11]

Lockyer's phrasing in his pamphlet is at best ambiguous, and could actually refer to mercury, with an apparent denial of antimony through association; if it was a denial, then it was a poor attempt to discourage the counterfeiters since there is support for Johnson at the close of the century from George Wilson. At the end of the recipe for 'Dr. B's Panacea of Antimony' is a rare footnote: 'This is what Mr. *Lockyer* aimed at in the Composition of his Pill, by which he got a good estate'.[12]

> Take of Antimony Six Ounces, of Nitre Ten Ounces, of Common Salt One Ounce and an half, and of Charcole an Ounce; Let them all be made into Fine Powder, and well mixt, and be put into a red-hot Crucible by half a Spoonful at a time, continue the Fire a quarter of an Hour after; Then either pour it into a Cone, or let it cool in the Crucible, and you will find Three Substances, viz. in the Bottom a little *Regulus;* above that a compact Matter, something like the Liver of Antimony, and upon the Surface, a more Spungy Mass; separate them one from another, and put by the *Regulus;* Powder the other two, and wash them apart, till they have no Taste of the Salts; dry them gently, and keep for use.
>
> The uppermost Substance is counted the best, and is of a fine Golden Colour, when 'tis washt. The middle Substance is not of so pleasant a Colour, and works more Churlishly. The *Regulus* is equal with the *Regulus* of Antimony.

Since antimony occurs chiefly as the mineral stibnite (Sb_2S_3), so contains sulphur, these constituents bear some resemblance to black powder (gunpowder). Although the proportions differ from the recommended 75% saltpetre: 14% charcoal: 11% sulphur, the advice to add the mixture to the crucible in small increments seems wise. A handbill in the Wellcome Institute implies preparation with the help of a burning glass, although this illustration may have been chosen merely to emphasize the Pill's supposed 'solar' nature. Its precise constituents therefore remain debatable, although a higher antimony sulphide, perhaps with some oxide not yet fused into glass of antimony, may be possible. Unfortunately, there is no help to be gained through the Patents Office.

The idea of a universal medicine, underlain by theological and Paracelsian concepts, was not new. Since Puritans saw a definite relationship between experimental science and religious experience, chemists laboured enthusiastically to release medicines 'imprisoned' by God in all natural products. Even toxic substances like mercury and arsenic were investigated, in the belief that their violence could be neutralized in order to expose therapeutic values.

This is well illustrated in the case of antimony. Known for over three millennia and long considered a poison, it had become widely used in printing since it hardened the type metal and sharpened definition. But the 1604 author of *The Triumphal Chariot of Antimony* undertook to prove that from it there could be prepared 'a medicine which radically destroys all diseases, and penetrates and consumes them', as long as it was correctly prepared.[13] A vast range of antimonial medicines were subsequently to enjoy a long period of popularity in England, especially in the seventeenth and eighteenth centuries. The author Henry Fielding, playwright Oliver Goldsmith and George III all partook, with varying degrees of credulity and efficacy.

Lockyer's belief in his antimonial pill as a universal medicine thus becomes more comprehensible. His list of about 60 ailments and afflictions that could be ameliorated is too long to detail here, but there was still some realism within his enthusiasm: it would only help *natural* diseases, and was of no use where bowels, lungs or liver were rotten and putrefied, or where there was a disease which no man could heal. It had even helped him in his own lameness, twice, to the point of his managing without a waistcoat in the long, cold winter of 1662.

Antimony worked primarily as a diaphoretic and emetic, so was useful as an antipyretic — hence Dr James's Fever Powders eighty years later. Larger doses could act as purgatives, so stories of large worms being expelled are to be expected. Lockyer's emphasis was always on innocuous evacuation in some form, so the influence of the humoral doctrine still predominated even though there was no direct mention of 'restoring balance'.

There is at least one known instance of it having been independently prescribed, though the subsequent postmortem findings suggest misplaced optimism. Margaret Girling of Rumborough, Suffolk, aged 24, had long had thoracic symptoms which failed to respond. Eventually her physician, Nathaniel Fairfax, at Woodbridge,

> being desirous to add an Empiricall remedy, gave her 3 of Matthew's pills, which sweat her lightly, but beyond what she ever remembered. Severall dayly doses of Lockiers pills, 4 per dose removed the julking [her term for the audibly splashing fluid], as she said lower to her

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midriff. When she, fearing an hypercatharsis, layd them by for 2 or 3 days, & then taking them up again could find no further alteration by them.

Alas for Fairfax's efforts, she died the following year, and his account of the autopsy findings refers to about three pints of 'thick milk' within the thoracic cavity.[14] Whether he ever prescribed Lockyer's pills again is unknown.

Efficacy and competition

Evaluation of the efficacy of any proprietary medicine is always a complex matter, the more so when it is an early one. Anecdotes and advertising cannot compete with controlled clinical trials, but frequently are all that is available. Despite what is known today about antimonial toxicity and effects on enzymes and cell metabolism, this particular preparation seems to have retained public confidence. Whether the claimed successes and testimonials were fabricated or not, sales flourished, rivals attacked it, counterfeiters sought to imitate it.

Lockyer was all too aware of the vociferous disparagements by calumnies and false imputations which aimed to push his Pill out of the market. Refusal to reveal the constituents and use of the three boars' heads on the seals had to be augmented by the incorporation of his portrait into the pamphlets (despite the extra cost) and emphasis that the only genuine suppliers were those listed at the end. The bookseller Robert Horne, in the first Court entering out of Bishopsgate-street into Gresham College, for example, was an authorized vendor, but not so a man called Rookes in the same place. Vendors were threatened with withdrawal of authorization and court proceedings if they purchased the Pills from alternative suppliers, and were encouraged to return such pills, books and bills to Lockyer himself and refer these suppliers to him for their money, which he felt would be a considerable deterrent. To his sorrow, some of his own former 'theivish' servants, male and female, had succumbed to temptation and employed a man called Galree (who adopted the alias Edward Cosyns) to sell counterfeit Pills up and down the country; he was already in suit with several people about this cheat.[15]

Competition by undercutting was supplemented by claims that the Pills 'were made of Antimony, and did kill many', to discourage prospective purchasers, in London and also in Dublin. One of Lockyer's early Irish suppliers, the Rev. William Hewson, was much distressed by a scurrilous and virulent attack (probably early 1664) from an 'unworthy Book-seller', which accused Hewson of buying the pills at a cheap rate and selling them in Dublin 'at a deare one' for his own personal gain.[16]

Aware that his decease might open the floodgates, Lockyer repeatedly emphasized that Thomas Fyge was the only other authorized manufacturer of the Pills, and that his boxes would be sealed with his own coat-of-arms, six fleur-de-lys and three spur-rowels. In the event, after 1672, the latten boxes were wrapped up in white paper and sealed with both Lockyer's and Fyge's respective arms, and the names of Thomas Fyge and John Watts written inside the paper.

Death, bequests and inheritors

Lockyer died at his home on 26 April 1672. Two months earlier, his funeral arrangements had been organized in some detail: he was to be interred within the parish church of St Saviour (now Southwark Cathedral), which adjoined his own small St Thomas's; two hundred men of his friends, neighbours and acquaintances were to be invited to the funeral, each receiving a gold mourning ring worth at least 7s. for their pains; as many poor men as his age at death were also to attend, with a gown to wear when accompanying the corpse to the grave, while a company of poor Blue-Coat boys were to sing 'as is usuall'. The executors (Thomas Hill, linen-draper; Solomon Seabright, scrivener; John Watts, nephew), bequeathed £30 apiece to buy mourning, were to erect a 'faire and complete Tombe' over or near his grave, with a stone effigy, name, age and date of death engraved in gold, his coat of arms, and enclosure or railing in with iron bars. A little gentle pressure was being applied to the Vestry of St Saviour's for all this, since their acquiescence would ensure that £50 was divided amongst 200 poor families of the parish; if permission was not forthcoming, this legacy would be void and the money go to that parish where he did rest.

The churchwardens yielded easily. Lockyer was buried there on 7 May, and the Vestry minutes the following February noted:[17]

> Ordered that D[r] Lockiers Executors by the approbacon of the wardens erect a monum[t] for D[r] Lockier on the north p[ar]te of the church by the vestrey dore: not including above 2: foote from the bench of stone, and the wardens to accept what the Executors will give them for the 2: foote of ground.

The black and white marble tomb was decorated with columns, entablature and broken pediment; the effigy depicted a man lying at full length, dressed in a long furred gown and full-bottomed wig, right elbow resting on a pillow, head supported on that hand, a book in the left, and a cherub at the feet. At the back was inscribed:

> Here Lockyer lies interr'd, enough his name
> Speakes one hath few competitors in fame:
> A Name, soe Great, soe Generall't may scorne

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Inscription wch doe vulgar tombs adorne:
A diminution tis to write in verse
His eulogies, wch most mens mouths rehearse.
His virtues & his PILLS are so well known,
That envy can't confine them vnder stone,
But they'll surviue his dust and not expire
Till all things else at th'universall fire.
This verse is lost: his PILL Embalmes him safe
To future times without an Epitaph:

Wills cannot fully reflect an individual's wealth, since rarely are there indications of prior gifts such as a daughter's marriage settlements or provision for the education of grandchildren; wealth, furthermore, may be partly inherited, so if ancestral wills are unavailable for tracing property ownership and bonds, the gains amassed from an individual's own efforts can only be surmised. Whether or not the £2000 coming to him from his marriage to the widow Mrs Springal acted as pump-primer for the pill-making, Lockyer clearly did well from his efforts, even though it is difficult to put precise figures onto his gains. If some of the profits were ploughed back into production and promotion, the remainder was by no means locked away in his personal coffers. Philanthropy has not infrequently been used as a form of advertising or as a means of massaging the ego, but Lockyer seems to have had some genuine concern for the underprivileged. The sympathy shown in his 1652 ballad is reflected in Philo-Chemicus's biographical postscript:

> and that ever since he had given thirty two shillings a moneth where he saw need; having within this three or four years sold thirty pounds a year, not regarding worldly treasure; but the more he slighted it, the more God hath blest him, and given him a sufficiency to purchase an earthly inheritance, but he said he was strongly opposite to all earthly purchases, minding much more to do the errant for which he was sent, having an eye to the recompense of reward, which is to have a dwelling in that City whose builder and maker is God.

This savours of the medieval concern with hospices, founded on earth to buy grace in heaven, but Lockyer's brand of Anglicanism (which inclined more towards puritanism than papalism) would have wanted to see material results from his charity.

His will gives further indication of his beneficence. Once funeral expenses had been met, specific monetary bequests to family and friends totalled £2710 (of which £290 was to be distributed amongst the poor of nine indicated parishes), and an annuity from the rents of the Royal Oak inn in Hatton Garden was to be paid to his remarried daughter-in-law Preservat Bailey, in Yarmouth. The two main legatees were his nephew John Watts and daughter Dinah Byer, the former receiving the leases of five separate premises as well as the quarter share of the vessel *Bartholomew of London,* books, instruments and receipts for the pill already mentioned, half the right, title and interest in the Royal Oak, and half the residue of moneys, leases, goods, chattels, plate and estate. Clearly, Lockyer was comfortably off, with income and wealth keeping him firmly within the merchant class.

Many proprietary medicines faded away after the death of their inventor — Joshua Ward's preparations (which also contained antimony) are convenient examples — but Lockyer's Pills seem to have done better than many, although the immortality envisaged in his epitaph was not to be. They were advertised in the *Boston News-Letter* in November 1761 and the *Pennsylvania Gazette* in December 1768, referred to in the *New York Packet* in October 1784, and were listed in the schedule to the 1785 Stamp Duty Act (and again in 1804 and 1812). However, they were not in the list published in 1853 in the *Medical Circular,* from which it might be concluded that they were no longer a proprietary. In the 1870s, the surgeon/local historian William Rendle had hoped to be able to exhibit them during a lecture at the Borough Road College in Southwark, but was disappointed to find that no-one then in the trade had heard of them.[18]

The receipt or formula for a proprietary medicine could be quite important, particularly when successful, since it might have a not inconsiderable monetary value. Some sales or auctions of receipts were peaceable, but family in-fighting over profitable inheritances is not unknown, with claims, counter-claims, greed and hostility to the fore. For this reason, wills often included very precise instructions about inheritance of the formulae and who could benefit. Lockyer's receipts and the pills themselves can be traced for almost a century after his death through this means. After the publication of his 1664 pamphlet, he had decided to share the secrets of preparation to a limited extent. The first recipient, by implication, was Charles II, this probably being related to the calcining demonstration before the Court at Southampton House that June:

> But since the Printing of my Book *May* the 2. 1664, I have given my Secret to three persons, whom in regard of their Greatness, I dare not mention, considering what *Solomon* saith, *The Kings wrath is as the roaring of a Lion, but his favour is as dew upon the Grass,* Prov. 19. 12.

The other two, already referred to briefly, were his nephew John Watts and his apothecary friend Thomas Fyge, at Bishopsgate.

Watts had been his uncle's chemical operator and assistant, sharing his home even after marriage. Lockyer may never have seen his twin great-

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nephews, since the boys were christened on 1 May 1672, but he had died five days earlier. Royce probably died in infancy, but John junior survived to complete his apprenticeship and be admitted to the Company of Barber-Surgeons on 4 January 1697, before setting up on his own at the newly rebuilt Racquet Court, just off Fleet Street.[19] The Wellcome handbill (which, from internal evidence, cannot date from before 1705) lists the pills' main distributors as John Watts senior and junior, and the daughters of Thomas Fyge, so the links with the latter family must be considered.

Thomas Fyge the medical apothecary, whose daughter Margaret had been Lockyer's god-daughter, had signed indentures of co-partnership with the energetic young barber-surgeon on 21 November 1700:[20]

> [as] Joint Operators Dealers and Sharers in the making preparing Selling and Vending of a certain Chymical Preparation or pill commonly called or known by the name of Doctor Lockyers Pill for the term of Ninety nine years ...

Fyge died in March 1705 aged 72, and left his half of the profits of the Pill with what remained of a bond of £100 from John Watts equally among his five younger daughters by his last wife Mary; as each died, their portions were to go to the remaining sisters.[21] Thus by 1731, these allocations were together again, in the hands of the sole surviving but unmarried sister Hannah.

The moiety held by John Watts junior was similarly broken up and then reconstituted. Although his brothers Royce and Lockyer were dead, his sisters Mary and Elizabeth had survived, and on 29 January 1710/11, his half-share of great-uncle's Pill was divided, though with unknown proportions: one part to sister Mary and her husband Charles Tockfield, another to his still unmarried sister Elizabeth, and the third to be retained by himself.

When the business-like Hannah Fyge died (buried 29 November 1738, aged 56), she had chosen not to pass on her half-share of those profits which might accrue during the residue of the 99-year term to distant relatives but to put it back into the hands of the Watts family. Splitting it into three equal parts, the portions for Mary and Elizabeth (via the executors and administrators) were to be for their use only, wholly free of any control by their respective husbands; when either died, their portion was to revert to the surviving sister. The 'Receipt or direction in Writing for making and preparing the said Medicine which is now in my Study' was also returned into their care.[22] Control was now within the one family, and it may have been to commemorate this that the Southwark Cathedral monument was repaired in October 1741.

John Watts had completed his term as Master of the Barber-Surgeons' Company in 1736, and retired to Tottenham High Cross, but despite drawing up a testamentary schedule, neither executors nor residuary legatee were named, so his widow Sarah was granted powers of administration after his death in April 1743.[23] Mary meanwhile had married for a second time to the weaver Edward Whitehouse. From her extremely detailed will, the body of which was formulated in 1754, she was by then:

> possessed of and entitled to three ffourth Parts or Shares of and in the whole Profits of the said Medicine and all benefit and advantage whatsoever that shall happen or accrue by means or Occasion of the making Composing Selling or Vending the same And Whereas I am also possessed of the true Original or Prescription for the making up and preparing the said Pill or medicine ...

Although by then she had a male great-grandson, any immediate family appears to have been ignored, as three quarters of this personal holding was to go to the apothecary Samuel Watson, the son of a close friend Mary Watson; from his share of the profits, £10 was to be paid yearly to his mother for the rest of her life. The remaining quarter was bequeathed to another widow, Mrs Sarah Wallis (then Matron of the adjacent Guy's Hospital), for her lifetime before reversion to Samuel Watson.

By early 1759, the apothecary must have offended in some way, since a codicil dated 21 January suggests a fall in favour: of the Watson portion, he was to have only a moiety, the other half going to his mother Mary. Furthermore, as soon as she (Mary Whitehouse) had died, he was to execute a bond to his mother in the penalty of £500 upon condition that he would not reveal the secret of making the Pill to any person or persons whatsoever; refusal to comply would result in his moiety going to his mother, who was now included with the other executors.

The remaining quarter share of the profits not held by Mary Whitehouse was then in the hands of Samuel Rutter, son-in-law and partner of John Watts, and a well-regarded operator for the teeth in his own right. His name occurs in various wills in the Fyge and Watts families, as either executor or legatee, and his holding had been inherited from his 'Mother' [strictly, mother-in-law] Sarah Watts, who had outlived her husband barely two years.[24]

Some of Rutter's executors' papers from 1761-62 have survived, which enable a figure to be put on the monies coming in a full century after the Pill was first marketed. He had had five daughters, of whom three had survived to marriage and had issue. His 'Right Title Claim or Interest in and to the said fourth

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part of the said Pill and all the profits and Advantages which may and Shall arise from preparing and Selling the same' went to the second daughter Frances, as well as custody of two of the original receipts. This choice was probably due to the fact that she had been widowed early from Christopher Bell. In 1762, the Pill brought in just over £43 to Mary Watson, Mrs Bell [i.e. Frances], Sarah Wallis and Samuel Watson; of this, £10 15s 1d. subsequently went to Frances (who, for that year at least, shared it with her sisters).[25] There was no scope here for philanthropy on the scale of the original inventor, but it would have served as valuable income when three fatherless children had to be cared for. It is quite likely that, by then, Dr Lockyer's Pill had become displaced by Dr James's Fever Powder, since this was being very heavily promoted.

Frances, unfortunately, died in June 1763, acutely aware that the administration of her father's estate was still incomplete and that her three children were still under age, so all rents, profits and interest should in the meantime be applied to their maintenance and education. The subsequent rights to the Pill, through either Samuel Watson or the Bell children, remain to be traced.

Acknowledgements

The attempts to reproduce the pills' contents from the limited amount of information available were undertaken by the late Dr W.A.Campbell, University of Newcastle-upon-Tyne, whose interest in Lockyer is gratefully acknowledged.

End-notes

1. Dorset CRO, Bradford Abbas parish registers (no document reference supplied).
2. PRO PROB 11/339 sig.63.
3. Starkey G. *A Smart Scourge for a Silly Sawcy Fool.* London, 1665. The 1664 supportive letter was later appended to Lockyer's November 1665 pamphlet.
4. 'Philo-Chemicus'. *Aut Helmont, Aut Asinus: or, St. George Untrust. Being a Full Answer to his Smart Scourge.* London, 1665.
5. Crellin J. K. and Scott J. R. "Lionel Lockyer and his pills", *Proc. XXIII Internat. Congress of the Hist. of Med.* London, Wellcome Institute for the History of Medicine, 1972: 1182-86; Johnson W. *Agurto-Mastix. Or, some brief Animadversions Upon two late Treatises; One of Master George Thomsons, entitled, Galeno-Pale; The other of Master Thomas ODowdes, Called, The Poor Mans Physitian.* London, 1665.
6. Bloom J.H. and James R.R. *Medical Practitioners in the Diocese of London, Licensed under the Act of 3 Henry VIII, C.11: An Annotated List 1529-1725.* Cambridge: University Press, 1935: 50, 73. The year of Willcox's licence is misprinted as 1699 instead of 1669.
7. GLRO, X39/1b (microfilm).
8. Lockier L. *The Character of a Time-Serving Saint: or, the Hypocrite Anatomized, and Thoroughly Dissected.* London, 1652.
9. Lockier L. *An Advertisement Concerning those most Excellent Pills Called Pillulae Radiis Solis Extractae.* London, 1665. The British Library holds a copy dated November 1665 (BL 7461.b.30), and Cambridge University Library one for May 1667 (Bb* 10.37^3 (E)).
10. Cambridge University Library, Bb* 10.37^4 (E).
11. See note 5.
12. Wilson G. *A Compleat Course of Chymistry.* London, 1699: 103-04. Attempts to reproduce this are handicapped by the vagueness of experimental conditions; although the chemistry is rather imprecise, the end-product is mainly glass of antimony, without any obvious regulus, unlike George Wilson's description.
13. 'Basilius Valentinus'. *The Triumphal Chariot of Antimony,* trans. into English. London: Elliott, 1893: 68.
14. Hall A.R. and Hall M.B. (eds) *The Correspondence of Henry Oldenburg.* 8 vols, Madison/ Milwaukee/ London: University of Wisconsin Press, 1965-71, III: 401-03.
15. May 1667 pamphlet, p.14.
16. Lockyer L. *Dr Lockyer's Vindication* London, 1668, preface and 1st letter. The title page is incorrectly dated 1658.
17. GLRO P92/SAV/451. The 'bench of stone' was a ledge built into the church wall for seating. The tomb, now in the northwest corner of the north transept, survived the Blitz, but is timeworn and any railings have vanished.
18. Young J.H. *The Toadstool Millionaires.* Princeton NJ: Princeton University Press, 1961: 3, 10; Rendle W. *Old Southwark and its People.* London, 1878: 193.
19. His interests centred around the teeth, and Racquet Court is now regarded as the first wholly dental practice in London.
20. Cited in the will of Mary Whitehouse (PRO PROB 11/850 sig.344).
21. PRO PROB 11/481 sig.49.
22. PRO PROB 11/692 sig.260.
23. PRO PROB 11/726 sig.182.
24. [Sarah Watts] PRO PROB 11/738 sig.66; [Rutter] PRO PROB 11/870 sig.406. Sarah's will does not indicate the proportion of her holding.
25. Held at Bruce Castle Museum, Lordship Lane, London.

Help Wanted.

'Information on seventeenth century apothecaries sought!.

As part of a doctorate on London apothecaries in the seventeenth century, Patrick Wallis is developing a data base of metropolitan apothecaries, their families and work. Any original information that readers can supply relating to apothecaries of this period would be very gratefully received. It is hoped that the database will be made publicly accessible when complete. Material and queries should be addressed to Patrick Wallis, Wellcome Unit for the History of Medicine, 45-47, Banbury Road, Oxford, OX2 6PE.'

'Beauty products'

Miss Joanna Castle of 15,Coleman Street, Brighton, BN2 2SQ, is currently completing the History of Medicine of the Society of Apothecaries. She 'specialises in fifteenth and sixteenth century medicinal ingredients and those used in women's beauty products' and would like to contact others with an interest in similar areas.

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The Leprosy Museum at Bergen, Norway.

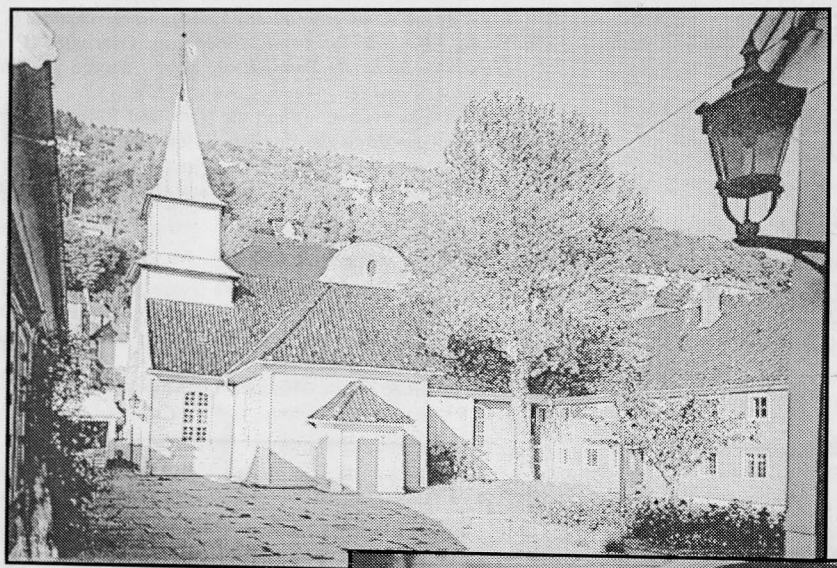
The Editor has been on her travels again, and this time took the opportunity of visiting the Bergen Leprosy Museum which is housed at St. Jorgens's Hospital, an old leprosarium whose history can be traced back to 1411. Today we associate leprosy with the tropics so it is surprising to read that in the middle of the last century in some areas of Norway there was an incidence of 3%. A National Leprosy Registry was established in 1856 and became the basis for a control programme;

In 1839 Daniel Cornelius Danielssen (1815-94) was appointed to the hospital to make a study of the disease based on the patients. He described the symptoms in detail and the results of post-mortems. In conjunction with Carl Wilhelm Boeck (1805-75), late medical officer at the Kongsberg silver mines until 1840, a monograph was published in 1847. This led Gerhard Henrik Armauer Hansen (1841-1912) to begin his studies of leprosy in 1868, and resulted in his discovery of the leprosy bacillus, M. leprae, five years later.

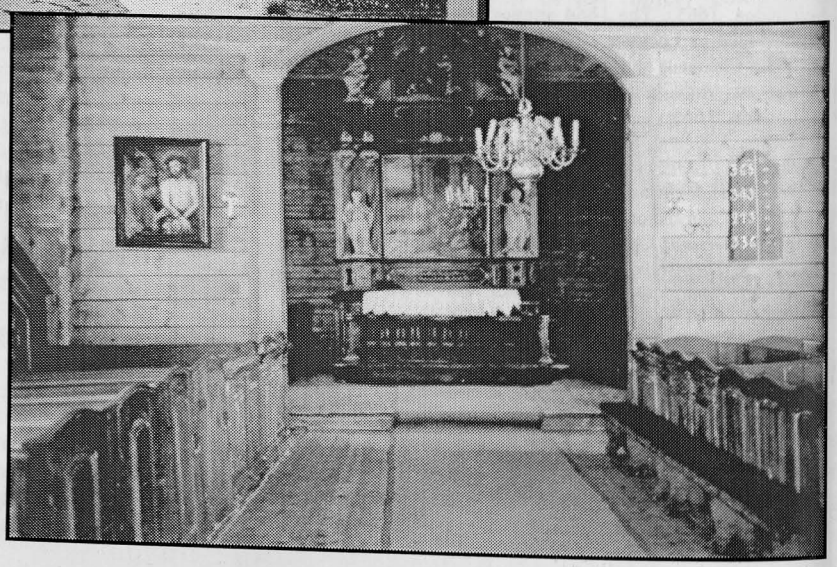
Leprosy studies were for many years hindered because it proved impossible to infect laboratory animals with the disease or to cultivate the micro-organism. Hansen even tried to implant material taken from a patient into non-leprous persons. An action was eventually brought against Hansen for these experiments and he was removed from Leprosarium No.1, although he retained his position as Chief Medical Officer for Leprosy. Since when, in 1972, it was shown that the armadillo can be infected, and in 1975 that the bacillus can be grown successfully.

Rooms 1 and 2 on the left (both very small) of the main two-storey room are Danielssen's laboratory and surgery, where may be seen his microscope, cupping glasses, splints for fractures, simple apparatus for the analysis of blood and ear trumpets for communication with the elderly patients. On the right are two rooms which have been fitted up to show the conditions under which patients lived during the badly over-crowded years of the first half of the 19th. century. There were two very uncomfortable looking beds in each cell, a third patient often sleeping on the floor. Each patient prepared his own food which was kept in a numbered locker in the kitchen. There were only two nurses in the hospital which could have as many as 150 patients.

Attached to the hospital is the church of St. Jorgen's which was built in 1702, one of the largest wooden buildings in Norway. Today the church is used for services in foreign languages.



St Jorgen's Church with the hospital to the right.



Interior of the church.

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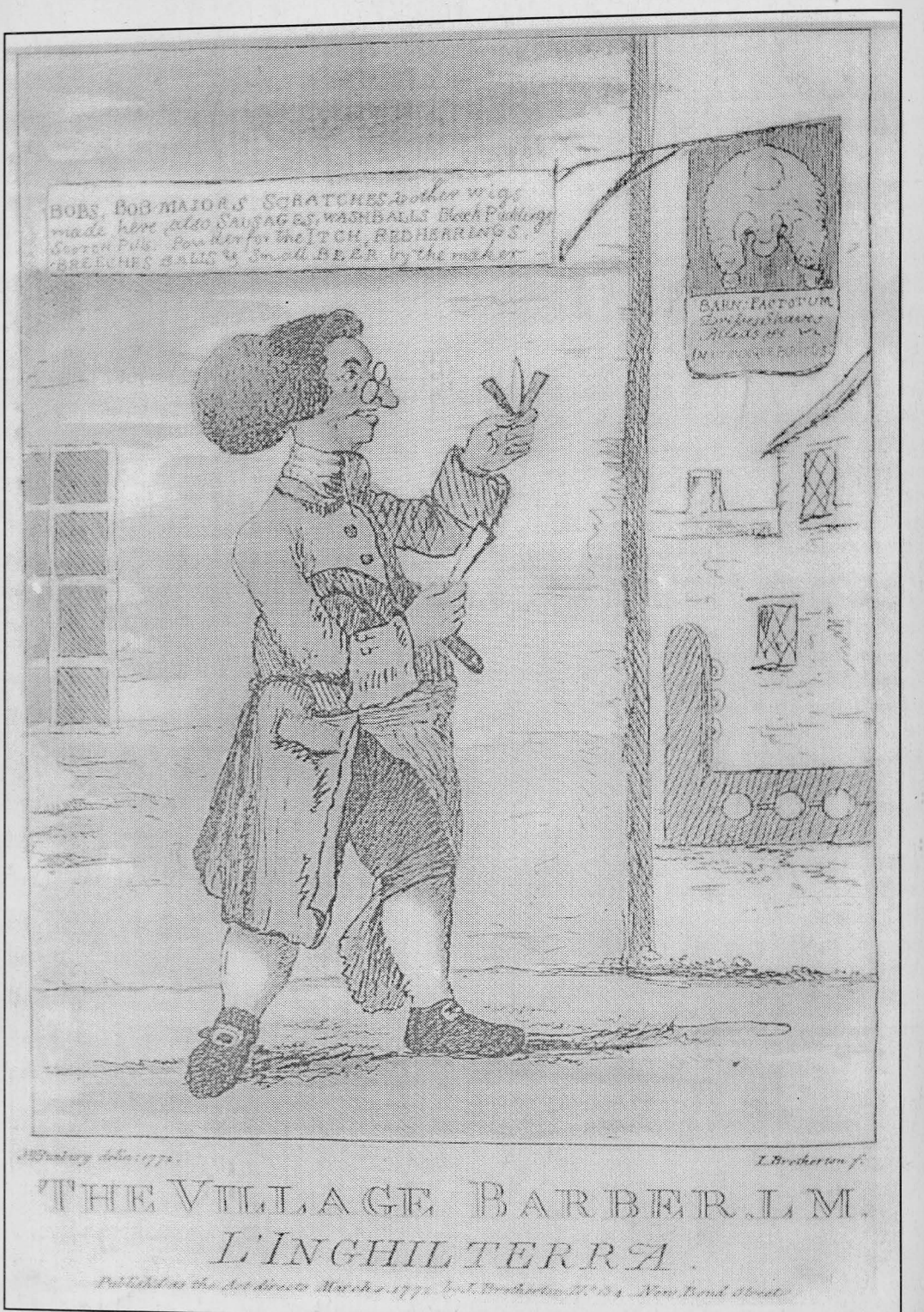

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